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DEPARTMENT OF THE INTERIOR

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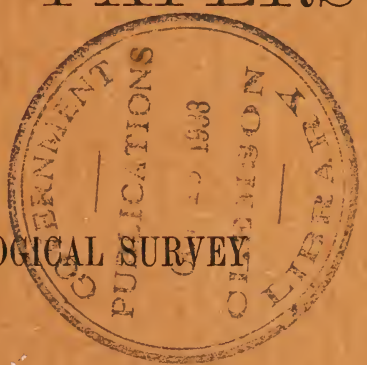
WATER-SUPPLY

AND

IRRIGATION PAPERS

OF THE

UNITED STATES GEOLOGICAL SURVEY



No. 52

OPERATIONS AT RIVER STATIONS, 1900.—PART VI

WASHINGTON
GOVERNMENT PRINTING OFFICE
1901

IRRIGATION REPORTS.

The following list contains titles and brief descriptions of the principal reports relating to water supply and irrigation, prepared by the United States Geological Survey since 1890:

1890.

First Annual Report of the United States Irrigation Survey, 1890; octavo, 123 pp.

Printed as Part II, Irrigation, of the Tenth Annual Report of the United States Geological Survey, 1888–89. Contains a statement of the origin of the Irrigation Survey, a preliminary report on the organization and prosecution of the survey of the arid lands for purposes of irrigation, and report of work done during 1890.

1891.

Second Annual Report of the United States Irrigation Survey, 1891; octavo, 395 pp.

Published as Part II, Irrigation, of the Eleventh Annual Report of the United States Geological Survey, 1889–90. Contains a description of the hydrography of the arid region and of the engineering operations carried on by the Irrigation Survey during 1890; also the statement of the Director of the Survey to the House Committee on Irrigation, and other papers, including a bibliography of irrigation literature. Illustrated by 29 plates and 4 figures.

Third Annual Report of the United States Irrigation Survey, 1891; octavo, 576 pp.

Printed as Part II of the Twelfth Annual Report of the United States Geological Survey, 1890-91. Contains "Report upon the location and survey of reservoir sites during the fiscal year ended June 30, 1891," by A. H. Thompson; "Hydrography of the arid regions," by F. H. Newell; "Irrigation in India," by Herbert M. Wilson. Illustrated by 93 plates and 190 figures.

Bulletins of the Eleventh Census of the United States upon irrigation, prepared by F. H. Newell; quarto.

No. 35, Irrigation in Arizona; No. 60, Irrigation in New Mexico; No. 85, Irrigation in Utah; No. 107, Irrigation in Wyoming; No. 153, Irrigation in Montana; No. 157, Irrigation in Idaho; No. 163, Irrigation in Nevada; No. 178, Irrigation in Oregon; No. 193, Artesian wells for irrigation; No. 198, Irrigation in Washington.

1892.

Irrigation of western United States, by F. H. Newell; extra census bulletin No. 23, September 9, 1892; quarto, 22 pp.

Contains tabulations showing the total number, average size, etc., of irrigated holdings, the total area and average size of irrigated farms in the subhumid regions, the percentage of number of farms irrigated, character of crops, value of irrigated lands, the average cost of irrigation, the investment and profits, together with a résumé of the water supply and a description of irrigation by artesian wells. Illustrated by colored maps showing the location and relative extent of the irrigated areas.

1893.

Thirteenth Annual Report of the United States Geological Survey, 1891–92, Part III, Irrigation, 1893; octavo, 486 pp.

Consists of three papers: "Water supply for irrigation," by F. H. Newell: "American irrigation engineering" and "Engineering results of the Irrigation Survey," by Herbert M. Wilson; "Construction of topographic maps and selection and survey of reservoir sites," by A. H. Thompson. Illustrated by 77 plates and 119 figures.

A geological reconnoissance in central Washington, by Israel Cook Russell, 1893; octavo, 108 pp., 15 plates. Bulletin No. 108 of the United States Geological Survey; price, 15 cents.

Contains a description of the examination of the geologic structure in and adjacent to the drainage basin of Yakima River and the great plains of the Columbia to the east of this area, with special reference to the occurrence of artesian waters.

1894.

Report on agriculture by irrigation in the western part of the United States at the Eleventh Census, 1890, by F. H. Newell, 1894; quarto, 283 pp.

Consists of a general description of the condition of irrigation in the United States, the area irrigated, cost of works, their value and profits; also describes the water supply, the value of water, of artesian wells, reservoirs, and other details; then takes up each State and Territory in order, giving a general description of the condition of agriculture by irrigation, and discusses the physical conditions and local peculiarities in each county.

Fourteenth Annual Report of the United States Geological Survey, 1892–93, in two parts; Part II, Accompanying papers, 1894; octavo, 597 pp.

Contains papers on "Potable waters of the eastern United States," by W J McGee; "Natural mineral waters of the United States," by A. C. Peale; "Results of stream measurements," by F. H. Newell. Illustrated by maps and diagrams.

(Continued on third page of cover.)

DEPARTMENT OF THE INTERIOR

WATER-SUPPLY

AND

IRRIGATION PAPERS

OF THE

UNITED STATES GEOLOGICAL SURVEY

No. 52

WASHINGTON
GOVERNMENT PRINTING OFFICE
1901

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UNITED STATES GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

OPERATIONS AT RIVER STATIONS, 1900

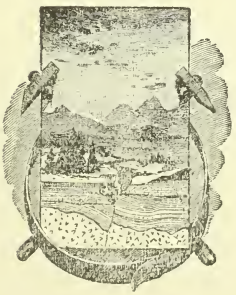
A REPORT OF THE

DIVISION OF HYDROGRAPHY

OF THE

UNITED STATES GEOLOGICAL SURVEY

PART VI



WASHINGTON
GOVERNMENT PRINTING OFFICE
1901

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OPERATIONS AT RIVER STATIONS, 1900.[1]

PART VI.

PRECIPITATION ON MOUNTAINS IN SOUTHERN CALIFORNIA.

In order to obtain rainfall data bearing upon river discharge, a number of rainfall gages have been established at various points in the mountainous regions of California. Results obtained at these localities during 1900, together with a few figures from other sources, are given in the following tables. The first table gives the location of the rainfall stations; the second table gives the depth of rainfall, in inches, for each month of the year. Similar figures for 1896 are given on page 418 of the Eighteenth Annual Report, Part IV; for 1897, on page 539 of the Nineteenth Annual Report, Part IV; for 1898, on page 560 of the Twentieth Annual Report, Part IV; and for 1899, on page 437 of Water-Supply Paper No. 39.

Rainfall stations in southern California.

Station.	County.	Post-office.	Latitude.	Longitude.	Elevation.
			° ′	° ′	*Feet.*
Sisson	Siskiyou	Sisson	41 27	122 25	3,555
Dunsmuir	do				
Delta	Shasta				
Redding	do				
Redbluff	Tehama	Redbluff	40 12	122 20	324
Jacinto	Glenn				
Upper Lake	Lake				
Sonora	Tuolumne	Sonora	38 00	120 16	1,824
Second Garrotte	do	Groveland	37 49	120 12	2,900
Crockers	do	Sequoia	37 48	119 53	4,453
Yosemite	Mariposa	Yosemite	37 45	119 35	4,063
Millwood	Fresno	Millwood			
Milo	Tulare	Milo	36 15	118 50	3,200
Kernville	Kern	Kernville	35 45	118 25	2,600
Isabella	do	Isabella	35 48	118 25	2,600
Taylor's ranch	do	Weldon	36 20	118 17	2,640
Mount Breckenridge	do	Bakersfield	35 25	118 35	6,750
Bear Valley	do	Tehachapi			4,000
Tejon ranch	do	Bakersfield	35 00	118 45	1,450
Fort Tejon	do	Lebec	34 53	118 53	3,245
Frazier mine	Ventura	Neenach	34 49	118 58	3,000
La Liebre	Los Angeles	do	34 46	118 40	3,170
Sneddens	Ventura	Griffin	34 41	119 03	4,900
Smith's ranch	do	Gorman	34 44	118 47	4,850
Palmdale headworks	Los Angeles	Palmdale	34 25	118 03	3,299
Mutah Flat	Ventura	Griffin	34 38	119 03	4,850
Magic Hill	Los Angeles	Burbank	34 23	118 22	2,820

[1] Continued from Water-Supply and Irrigation Paper No. 51.

Rainfall stations in southern California—Continued.

Station.	County.	Post-office.	Latitude.	Longitude.	Elevation.
			° ′	° ′	*Feet.*
Colby's camp	Los Angeles	Pasadena			3,875
Mount Sister Elsie	do	Monte Vista	34 17	118 14	5,021
Mount Lowe	do	Echo Mountain	34 15	118 07	3,200
Follows's camp	do	Azusa	34 14	117 49	1,800
Glenn ranch	San Bernardino	Cajon	34 50	117 30	3,112
Upper Holcomb	do	San Bernardino	34 18	116 50	7,200
Little Bear Valley	do	do	34 15	117 10	5,150
Morse's house	do	do	34 12	117 12	5,350
Deep Creek	do	do	34 17	117 05	5,200
Holcomb Creek	do	do	34 18	116 58	5,220
Squirrel Inn	do	do	34 12	117 12	5,300
Santa Ana River power house	do				
Mill Creek (a)	do	Redlands			5,000
Mill Creek (b)	do	do			2,915
Descanso	San Diego	Descanso	32 50	116 40	3,500
Campo	do	Campo			2,660
Laguna	do	do			5,760
Cuyamaca	do	San Diego	32 58	115 35	4,860
Sweetwater dam	do	National City	32 43	117 00	250
La Mesa					

Precipitation at rainfall stations in southern California, 1900.

Station.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
Sisson	8.64	1.04	9.92	3.49	2.05	1.24	0.00	0.16	0.67	10.76	4.52	3.80	46.29
Dunsmuir	9.93	3.32	6.27	4.85	3.18	.90	0.00	T.	1.20	6.13	7.16	8.29	51.23
Delta	12.25	4.60	9.45	8.59	4.10	1.56	.17	.20	.97	15.68	10.51	8.04	76.12
Redding	6.45	2.86	3.68	2.59	3.12	1.38	T.	.16	2.48	6.47	3.03	3.14	35.36
Redbluff	4.15	1.62	2.38	2.69	1.18	.94	0.00	.05	.21	3.25	3.23	2.07	21.77
Jacinto	3.06	.17	1.27	1.68	.72	0.00	0.00	0.00	0.00	2.42	5.00		
Upper Lake	3.98	1.31	3.53	2.13	.81	.35	T.	0.00	.03	3.96	5.08	3.63	24.81
Sonora	3.20	1.37	2.75	4.28	2.01	.20	0.00	.03	.14	5.10	10.29	2.05	31.42
Second Garrotte	5.25	1.25	3.75	4.00	1.50	0.00	0.00	0.00	.25	5.00	14.00	1.50	36.50
Crockers	5.98	1.18	4.28	3.56	1.80	.47	0.00	0.00	.62	9.71	17.43	1.39	46.42
Millwood									1.50	6.70	10.37	(a)	
Kernville	.80	.53	.58	.52	.90	0.00	0.00	0.00	.79	.10	5.09	0.00	9.31
Isabella	1.10	.65	.65	.73	1.06	0.00	0.00	.02	.30	.24	5.53	.05	10.33
Taylor's ranch	.71	.47	.50	.39	.82	.02	0.00	.03	.62	.02	4.29	0.00	7.87
Bear Valley	2.77	1.34	1.00	5.05	2.47	0.00	0.00	0.00	0.00	1.76	2.71	.32	17.42
Tejon ranch	1.17	.35	.41	1.97	1.57	.02	0.00	0.00	.06	.67	1.06	.34	7.62
Fort Tejon	2.12	.66	.85	1.82	1.57	0.00	0.00	0.00	1.06	0.00	1.71	.50	10.29
Sneddens	1.40	T.	1.45	.50	1.40	0.00	0.00	0.00	0.00	0.00	4.52	0.00	9.27
Smith's ranch	1.20	0.00	1.12	.12	.75	0.00	0.00	0.00	.15	0.00	3.10	0.00	6.44
Palmdale headworks	.65	0.00	.80	.57	.76	0.00	0.00	0.00	0.00	.20	1.79	0.00	4.77
Mutah Flat	2.80	0.00	1.95	.40	1.80	0.00	0.00	0.00	0.00	0.00	5.10	0.00	12.05
Magic Hill	1.34	0.00	1.67	2.05	4.40	.06	.04	0.00	.54	.71	6.53	0.00	17.34
Colby's camp	1.15	0.00	2.00	1.38	3.25	0.00	0.00	0.00	.25	.45	8.15	0.00	16.63
Mount Sister Elsie	.85	0.00	1.87	1.30	3.02	0.00	0.00	T.	.09	.81	6.70	0.00	14.64
Mount Lowe			2.90	2.15	4.05	.40	T.	0.00	.25	1.66	11.71	0.00	
Follows's camp		T.	2.40	1.77	2.98								
Glenn ranch	2.15	.10	3.84	1.35	1.69	.02	.01	0.00	.31	.46	9.39	0.00	19.32
Little Bear Valley	1.39	.43	3.42	3.11	4.63								
Morse's house	2.20	.44	3.83	5.81	8.64								
Deep Creek	1.40	.28	3.07	2.70	4.75								
Holcomb Creek	.38	.21	1.14	1.25	1.20								
Squirrel Inn	1.73	.26	3.04	4.81	6.37								
Santa Ana River power house	.10	0.00	2.38	5.49	3.70	0.00	0.00	0.00	.98	.74	8.26	0.00	21.65
Mill Creek (a)	2.52	.43	2.28	4.49							9.05		
Mill Creek (b)	1.41	.07	1.43	3.74	3.31	0.00	0.00	0.00	1.14	1.15	4.96	0.00	17.21
Descanso	4.00	.75	1.25	4.25	2.69	.06	0.00	T.	.25	.63	6.50	.15	20.53
Campo	2.65	.10	.55	2.07	1.04	.10	0.00	0.00	.05	.28	4.47	0.00	11.31
Laguna	3.30	.37	1.00	3.80	2.19	.30	0.00	0.00	.20	.40	6.20	0.00	17.76
Cuyamaca	3.62	.26	2.51	6.69	2.81	.10	.28	0.00	.92	.74	11.97	.04	29.94
Sweetwater dam	.57	0.00	.37	1.06	1.66	0.00	0.00	0.00	0.00	.25	1.63	0.00	5.54
La Mesa	.97	.03	.72	1.73	1.53	T.	T.	0.00	.01	.37	2.38	0.00	7.74

a Gage destroyed.
T indicates trace of rainfall.

CONSTRUCTION OF WELLS IN SOUTHERN CALIFORNIA.

Mr. H. N. Savage, of National City, California, states that in constructing wells in sand and small gravel he puts down a tube 3 inches in diameter, open at the bottom, the lower portion being perforated and wound with wire spaced 1 inch between coils. Around this wire is wrapped a wire gauze with 50 meshes to the lineal inch, and outside of this the wire is again wound, strips placed longitudinally to the pipe being soldered to each turn of the wire. The pipe with this perforated tube on the lower end is sunk by forcing muddy water down it, lengths being added as the pipe descends. It has been found that clear water can not be used successfully, but that a considerable amount of silt must be kept in suspension in the wash water. Presumably the sediment serves to coat the sand and prevent its adhering to the outside of the pipe.

In adding new joints to the top of the pipe, the change is made with great rapidity, so as not to shut off the wash water for more than a few seconds. If the water is stopped for a longer period the sand will settle against the pipe and prevent further progress. When the pipe has been settled into position, gravel is immediately shoveled around it, while the water is still rising on the outside. About one-half cubic yard of gravel is thus shoveled in. As soon as this is done pumping is started, to clean out the well. A centrifugal pump is used for the purpose. At first it is necessary to prime the pump often, sometimes every few minutes. Pumping is continued until the sand is exhausted—sometimes several days or a week is required to accomplish this. The top of the pipe is then connected to the permanent pump, no inside tubing being used.

Several hundred wells, most of them about 50 feet deep, have been driven by Mr. Savage by the common sand-pumping process, 5-inch pipe in 10-foot lengths being used for casing, the sand being pumped out as the casing is forced down to good water-bearing material. A strainer, usually made of 3-inch pipe covered with punched brass or with wire gauze, is put down inside of the casing, with a 2-inch pipe extending to the surface of the ground. The annular space between the interior of the casing and the exterior of the strainer and suction pipe, extending to the surface of the ground, is filled with coarse sand, and the casing is withdrawn.

Usually the supply is from a gang of 30 or 40 wells. Centrifugal pumps are used exclusively, generally horizontal compound, discharging with good efficiency into the main pipe line against a head of 50 to 60 pounds pressure per square inch.

Ten of these pumping plants have been installed by Mr. Savage for the San Diego Land and Town Company, and he makes the following statements in regard to them and to the wells which they serve:

The wells are in a valley of recent sedimentary deposits, consisting of uneven and irregular (a few inches to a few feet thick) strata of water-bearing, sandy silt, separated by similar strata of impervious, clayey silt. The best results—

economy of installation, yield of water, and duration of supply—have been obtained from wells about 50 feet apart, connected to main suction lines having a pronounced grade away from the pump. The wells were put down by first sand pumping through 5-inch standard screw pipe, cut into lengths of about 10 feet, a sand pump or bucket with jar and rods being used. The bucket is made of 4-inch (outside diameter) casing pipe about 6 feet long. The first section of 5-inch pipe being started, a lever is clamped to it. This serves also as a platform upon which the men stand while working the sand pump, and when the pipe is being turned with the lever their weight assists in forcing it into the ground. Additional lengths of pipe are put on as required, and the operation is continued until water-bearing sand of sufficient coarseness and thickness of strata is found, when the strainer, with sufficient pipe to reach from the bottom of the well to the top of the ground, is inserted within the 5-inch pipe. The annular space between the 5-inch pipe and the outside of the strainer with its pipe extension is filled with coarse sand or gravel, after which the outer or 5-inch pipe is withdrawn.

The strainer is made of a piece of 3-inch pipe from 2 feet to 4 feet long (depending upon the fineness of the sand-bearing stratum), perforated with $\frac{1}{2}$-inch holes spaced from 1 inch to $1\frac{1}{2}$ inches between centers. No. 12 B. W. G. wire is wound spirally over the perforated section (the spirals being spaced about 1 inch apart), which then is covered with a sheet of thin brass punched full of holes about $\frac{3}{32}$ inch in diameter. The punch was specially designed for this work. It has 24 points (four rows of six in a row), and one blow of the hammer is sufficient, the sheet being placed on a wood block. The punch makes either a cone or pyramidal truncated indenture through the sheet, which, when wrapped and soldered around the perforated pipe, gives a first-class strainer. The diameter of the holes punched in the brass sheet is reduced, of course, with the fineness of the water-bearing material. The holes presented to the water-bearing sand are very small, and since they increase in diameter toward the pipe, any material fine enough to enter does so without obstructing the opening. We use a 2-inch pipe extending from the strainer to the top of the ground.

As each well is completed a No. 6 Douglas hand pump is connected to the top, and it is thoroughly pumped, to free it from clayey matter and fine sand. Formerly we tested each well with a gasoline-actuated centrifugal pump, and left the bottom of the strainer pipe open. We have found it desirable, however, to plug the bottom of the strainer before putting it into the well, which of course decreases its capacity somewhat, but is imperative in quicksand formations. These wells yield 8 or 10 miners' inches each.

We are obtaining remarkably satisfactory results from horizontal centrifugal pumps, either single or compound, actuated by gasoline engines. I have just completed a plant, the supply of which is from a small gang of wells, which is operated by a No. 3 horizontal compound centrifugal pump actuated by a 22-horsepower gasoline engine, the water being discharged into the Sweetwater distributing system against 60 pounds pressure. When last measured the plant was developing a fraction more than 29 miners' inches.

There are numerous "tricks" connected with the installation and operation of these plants, both in sinking the wells and in operating the machinery, any one of which, we have found to our annoyance, would either make or break the success of the undertaking.

IRRIGATION IN UTAH VALLEY, UTAH.[1]

INTRODUCTION.

During the latter half of the month of August, 1899, data were obtained for a brief report on the irrigation systems of Utah Valley.

[1] Report of J. S. Baker.

Information regarding the history, the area irrigated, etc., was given by the presidents and directors of canal companies, by water masters, and by those most closely connected with irrigation along the various streams. In many cases the statements were from memory, although in most cases they were from records. Frequently it was necessary, owing to lack of time in which to make observations, to accept approximate estimates from those who contributed the information. In view of these facts the data are necessarily incomplete and in some cases are inaccurate, but they give, in a general way, the facts as they existed.

Utah Valley is in the north-central portion of the State, between the high Wasatch Range on the east and the low Lake Mountains on the west. There are about 150,000 acres of irrigable land in Utah County, most of it in Utah Valley. In 1890 there were 40,195 acres cultivated, and 36,586 acres irrigated; in 1899 there were about 65,000 acres irrigated. Utah Lake occupies, when at a mean elevation or "compromise line," about 84,000 acres in the northwestern part of the valley. The agricultural land lies along the eastern and southern sides. The upper lands consist of gravel, sand, and loam, while the lower lands bordering the lake are sandy loams and in many places adjacent to the lake are marshy.

Water for irrigation is supplied by Provo River, Spanish Fork, American Fork, Hobble Creek, Peteetnetr Creek, Current Creek, Summit Creek, Rock Canyon Creek, Goshen Warmsprings Creek, Salem Pond, Smith Brothers' spring, Mapleton Union or North reservoir, South Mapleton reservoir, and Mount Nebo reservoir. The principal facts in regard to these sources of supply are given in the following table and on succeeding pages:

Streams irrigating lands in Utah Valley in 1899.

Name of stream.	Drainage area.	Length.	Measurement.		Number of canals diverting water.	Area irrigated.
			Date.	Discharge.		
	Sq. mi.	*Miles.*	1899.	*Sec.-ft.*		*Acres.*
Provo River	1,000	90	June 29	1,745	16	*a* 20,000
Do			July 13	535		
Do			Aug. 16	340		
Spanish Fork	670	45	Aug. 22	139	5	17,708
American Fork	66	18	May 9	131	3	*a* 15,000
Do			Aug. 25	57		
Hobble Creek	160	25	Aug. 21	47	7	5,250
Peteetnetr Creek	30	10	May 1	21.3	17	1,400
Do			May 15	121.8		
Do			June 1	65.2		
Do			June 15	29.7		
Do			July 1	23.3		
Do			July 15	21.3		
Do			Aug. 1	17.0		
Do			Aug. 15	15.6		
Current Creek	12	12			7	2,500
Summit Creek		8	Aug. 23	14.6	*b* 8 to 14	1,200
Rock Canyon Creek			do	*a* 4.0		400
Goshen Warmsprings Creek			do	5.5	3	825
Spring Lake Creek			do	2.9		150
Salem Pond			Aug. 22	5.0	1	600
Smith Brothers' spring			Aug. —	.9		*c* 40

a Approximate.
b Some canals discontinue in low-water season.
c Orchard and vineyard.

The methods of irrigation throughout the entire valley are flooding for small grains and grasses and the furrow method for orchards and vegetables. The water is distributed on a time basis.

PROVO RIVER.

Provo River is the largest stream entering Utah Valley. It has its source in the summit of the Uinta Mountains, on the boundary line between Summit and Wasatch counties, and very near the sources of Bear, Weber, and Duchesne rivers. For about 18 miles it flows through a precipitous canyon, which in cases of heavy rainfall yields a large run-off. The river is therefore subject to great fluctuation. At the upper end of Provo Canyon is a large valley of the same name. This valley is useful to the lower irrigators as an underground storage reservoir. A part of the water of the river is applied to the land of the valley during the early part of the season, and reaches the river again by seepage shortly after the commencement of the low-water period, thus increasing the flow during that season. Indeed, it has been suggested by the people of Provo that the irrigators of the upper valley be paid to irrigate the uncultivated lands of that valley so as to still further increase, by seepage, the flow of the river below at a time when water is most needed. Since 1883 there have been but four years in which Provo River has carried a sufficient quantity of water to supply the needs of the irrigators below.

The water of the river is allotted as follows: Blue Cliff canal, Timpanogas canal, Provo Bench canal, one-eighth; Roberts's ditch, Park & Nuttall's ditch, Bomb & Richardson's ditch, Richmond & Penrod's ditch, Stubbs & Furgeson's ditch, West Union canal, two-fifteenths; Upper East Union canal, one-twelfth; Lake Bottom canal, one-fifteenth; East Union canal, Factory race, City race, and Tanner's, forty-three hundredths; and Little Dry Creek canal, one-fifteenth.

Blue Cliff canal.—This is the first canal diverting water from Provo River. It heads about 2½ miles above the mouth of Provo Canyon, on the north side of the stream. The greater part of it was built by the labor of the owners, but small portions were built under contract. In connection with this canal there is contemplated a reservoir on Provo Bench, three-fourths of a mile northwest from the mouth of Provo Canyon, with an area of 20 acres, a depth of 10 feet, and a capacity of 200 acre-feet.

Timpanogas canal.—This is the second canal diverting water from the river. It was built entirely by the labor of the appropriators. Measurements made July 9, 1897, by the water commissioner, Mr. A. L. Booth, of Provo, show a discharge of 7.27 second-feet. An annual tax of 50 cents per share, to pay the water master and general expenses of operating, is levied on the stock of the company. Considerable trouble has been experienced by frequent breaks in the embankment, which have deprived the irrigators of the use of water for a considerable length of time. Measurements for seepage loss were made August 16, 1899, one near the head and one 9,500 feet below. At the upper point the discharge was 10.40 second-feet; at the lower point it was 7.83 second-feet, showing a loss of 2.57 second-feet,

or 24.6 per cent of the discharge at the head. This is equal to a loss of 2.6 per cent per 1,000 feet.

Provo Bench canal.—This is the third canal diverting water from the river. It heads near the mouth of the canyon, on the west side of the stream. The diverting dam is made of two large logs buried to their tops, horizontally, in the bed of the stream, at right angles to the current. The lower log, which is 10 feet farther downstream, is the higher. On top of the logs planks are spiked transversely. An apron of 2-inch plank extends from the crest of the dam 20 feet downstream. On top of the crest and extending along it is a plank 10 inches high, placed on edge. The gates are two in number, each 7 feet high, 6 feet wide, and of 2-inch plank. They are operated by a rack and pinion and hand lever. The original water rights were acquired by appropriation, but later the canal was enlarged and water to fill it was purchased. Measurements for seepage on this canal were made August 17, 1899. The loss from that source and from evaporation was 4.31 second-feet (equal to 7.4 per cent of the amount at the head) in a distance of 1.5 miles. There are five small ditches diverting water from the river and from what is known as City Creek. Two of them—Roberts's ditch and Park & Nuttall's ditch—are on the west side of the river, and three of them—Bomb & Richardson's, Richmond & Penrod's, and Stubbs & Furgeson's—are on the east side of the river. Measurements of these ditches were made August 17 and 18, 1899, the results of which are given in the table on page 503.

West Union canal.—This canal is the fourth one diverting water from Provo River. It heads 1 mile below the mouth of Provo Canyon, on the west side of the stream. It was constructed in 1875–76 by day labor. In 1897 the West Union Canal Company consolidated with the Enterprise Canal Company under the name of the East Union Canal Company, and the canal was enlarged so as to carry the supply of both companies. The water has a rental value of $2 per share per annum. Measurements made on July 9, 1897, showed a discharge of 29.3 second-feet, and those made on August 4, 1897, a discharge of 30.6 second-feet. The interest in the canal is separate from that in the land; water rights do not go with the land, but are bought and sold as other property. Each owner can sell or rent his proportion of the water if he does not care to use it, but if he does not sell or rent it the company can do so and the revenue goes into the treasury of the company.

Upper East Union canal.—This is the fifth canal diverting water from the river, and the uppermost from City Creek, an old river channel through which irrigation water for the city of Provo is taken to the four canals serving it. The construction of the Upper East Union canal was begun in 1871 and was completed in 1874. It was built by day labor of the appropriators and by contract. The water rights were acquired by original appropriation. One share of stock in the company covers the right to the use of enough water to irrigate 1 acre of land. The canal was designed to carry 30 second-feet of water. On July 9, 1897, there were 32.35 second-feet flowing in it, and on August 4, 1897, 21.45 second-feet. Measurements made in 1899 will be found in the table on page 503. The loss in seepage on August 17, 1899, in a distance of 1 mile, was 0.75 second-foot, or 2.65 per cent of the amount at the head of the canal.

Lake Bottom canal.—This is the sixth canal diverting water from the river, and the lowest from the west side. It is taken out about 4 miles below the mouth of Provo Canyon. It was constructed in 1861, by the labor of the appropriators. Measurements were made July 9, 1897, near the head of the canal, and showed a discharge of 15.78 second-feet; those made August 4, 1897, showed a discharge of 12 second-feet. A large amount of water seeps into this canal from the irrigated land above, which consists of a deep gravel deposit. Being supplemented by seepage water it is not so subject to shortage as are the canals above.

East Union canal.—This is the seventh canal diverting water from Provo River. It is supplied through City Creek. It is nearly parallel to the Upper East Union canal, at an average distance of five-eighths of a mile. It was constructed in 1857, by the labor of the appropriators. The capacity was designed to be 27 second-feet. In 1874, upon the petition of the owners, the canal was placed under the control of the city of Provo, for the reason that most of the land under it was within the city. The water rights are valued at from $60 to $70 per acre for farms and $125 per acre for city lots.

Factory race.—This race is the eighth canal diverting water from the river. It is supplied through City Creek. It was enlarged in 1872, when an additional amount of water was appropriated. Its capacity is about 67 second-feet. Like the East Union canal, it was placed under municipal control in 1874. About three-fifths of the water of this canal is used by the Provo mills for power purposes; the remainder is used for irrigation.

Tanner's race.—This is the tenth canal diverting water from the river. Some of the water is used for power purposes, but after having passed the mills it is again used for irrigation. The capacity of the canal is about 27 second-feet. It was taken under the control of the city of Provo in 1874.

Little Dry Creek canal.—This is the last and the oldest canal diverting water from Provo River. Its headworks are near the northwestern part of the city of Provo. It was constructed in 1852, by the labor of the appropriators. On July 9, 1897, a measurement was made which showed a discharge of 12.5 second-feet; on August 4, 1897, another measurement was made which showed a discharge of 8.8 second-feet. Measurement made in 1899 will be found in the table on page 503.

Data regarding Provo River canals.

Name of canal.	Year of appropriation.	Capital stock.	Number of shares.	Value of shares.	Dimensions of canal.		
					Length.	Width.	Depth.
					Miles.	*Feet.*	*Feet.*
Blue Cliff canal *a*	1884	$50,000	2,000	$25	7	6	2
Timpanogas canal	1878	4,125	165	25	6	.....	.....
Provo Bench canal	1866	.....	.....	.....	9.5	.....	.....
Roberts's ditch *b*	.....	.....	.....	.....	.....	.....	.....
Park & Nuttall's ditch *b*	.....	.....	.....	.....	.....	.....	.....
Bomb & Richardson's ditch *b*	.....	.....	.....	.....	.....	.....	.....
Richmond & Penrod's ditch *b*	.....	.....	.....	.....	.....	.....	.....
Stubbs & Furgeson's ditch *b*	.....	.....	.....	.....	.....	.....	.....
West Union canal	1876	24,000	1,200	20	10	.....	.....
Upper East Union canal	1872	17,220	1,722	10	7.5	.....	.....
Lake Bottom canal	1858	.....	.....	.....	7	.....	.....
East Union canal *c*	1857	.....	.....	.....	5.5	.....	.....
Factory race	(*d*)	.....	.....	.....	4.5	12	3.5
City race *c*	.....	.....	.....	.....	5	.....	.....
Tanner's race *c*	1856	.....	.....	.....	6	.....	.....
Little Dry Creek canal	1852	4,000	400	10	4	.....	.....

a In course of construction.
b Data not ascertained.
c Under control of city of Provo.
d Time of first appropriation not learned; second appropriation in 1872.

Duty of water of Provo River canals in 1899.

Name of canal.	Measurements.		Length of irrigation period.	Duty of water.			
	Date.	Discharge.		Area irrigated.	Amount used.		Depth.
	1899.	*Sec.-feet.*		*Acres.*	*Sec.-ft.*	*Acre-ft.*	*Feet.*
Bluff Cliff canal *a*		41.66	Apr. 1 to Sept. 1	*b* 2,700	*b* 41.66	*b* 12,643	*b* 4.68
Timpanogas canal	Aug. 16	*c* 10.40 *d* 7.84	Apr. 15 to Sept. 15	650	7.84	2,379	3.66
Provo Bench canal	Aug. 17	*d* 53.65 *e* 57.96	Apr. 1 to Sept. 1	4,000	53.65	16,281	4.07
Roberts's ditch	do	2.80	Apr. 15 to Sept. 15				
Park & Nuttall's ditch	do	11.84	do				
Bomb & Richardson's ditch.	Aug. 18	*f* 1.00	do				
Richmond & Penrod's ditch.	do	*f* 4.00	do	*g* 1,200	10.00	3,035	2.52
Stubbs & Furgeson's ditch.	do	*f* 5.00	do				
West Union canal	Aug. 17	55.98	do	3,500	55.98	16,988	4.85
Upper East Union canal	do	*c* 28.27 *d* 27.52					
Do	May 8	29.28	Apr. 15 to Sept. 15	680			
Lake Bottom canal	Aug. 17	7.14	do				
East Union canal	Aug. 18	18.22	do				
Factory race	do	51.44	do	*h* 300			
City race	do	12.40	do	380			
Tanner's race *i*	Aug. 17	16.94	do	490			
Little Dry Creek canal	do	4.64	do	400	4.64	1,408	3.52

a Not yet completed.
b Calculated.
c Near head.
d Near laterals.
e One-half mile above first measurement.
f Float measurement.
g These three canals irrigate low land.
h Acreage reported by Walter Scott, of Provo; three-fifths of the stream used for power.
i Irrigates city property almost exclusively.

SPANISH FORK.

Spanish Fork is the second river of importance in Utah Valley. It rises near Soldiers Summit, in the tops of the Wasatch Mountains, near the eastern rim of the Great Basin. Throughout the greater part of its course it passes through a deep and narrow canyon about 30 miles in length, enters Utah Valley in the southeast corner, and thence flows in a northwesterly direction into Utah Lake. The following canals divert water from it for irrigation purposes:

East Bench canal.—This canal heads a short distance above the mouth of Spanish Fork Canyon, on the north side of the river. It irrigates the high bench east of the city of Spanish Fork.

Salem Irrigation Company's canal.—This canal heads a short distance below the East Bench canal, but on the south side of the river. It was planned in 1868, and was constructed in 1869–70, by the labor of the appropriators. Measurements are made every year at the head gate, which is 4 feet wide, and the depth varies from 17 inches down. This is all that is known by the irrigators of the amount of water flowing in the canal. As a means of keeping the canal free from sediment and aquatic vegetation, it is dredged twice each week during the irrigation season. The dredge is made of a railroad rail bent in a V shape, the distance between the two ends of the rail being equal to the width of the canal. The dredge is fastened by the apex, with the flange down, to the rear end of a cart, and is drawn down the entire length of the canal. This keeps the canal free from vegetation, prevents the accumulation of silt, and eliminates the necessity of an annual clean-up.

South Field Irrigation Company's canal.—This canal is taken out of the river

on the south side, below the Salem canal. It irrigates what is known as the Spanish Fork south field. It was constructed in 1867, partly by labor of the appropriators and partly by contract. Measurements are made every week, by the water master, over a weir board. Measurement made in 1899 is given in the last table on this page.

City canal.—This canal heads on the north side of the river, and conducts the water northwesterly about 3 miles, to the city of Spanish Fork. The water is used for power and for irrigation purposes. After leaving the mills the water used for power purposes is again used for irrigation. The water is owned by three companies—Spanish Fork Municipal Corporation, Southeast Field Irrigation Company, and Spanish Fork West Field Irrigation Company. The canal was built in 1850, by day labor of the appropriators; in 1865 it was enlarged to its present size. To the division gates, where the water is divided into the three canals by weir gates, as they are called, it is controlled by the city of Spanish Fork.

Lake Shore canal.—This canal is the last one diverting water from Spanish Fork. It heads on the south side of the river, about 3 miles west of the city of Spanish Fork. The channel of the river at that point is cut deep into the sandy soil, and consequently the canal is very deep.

Data regarding Spanish Fork canals.

Name of canal.	Year of appropriation.	Capital stock.	Number of shares.	Value of shares.	Dimensions.		
					Length.	Width.	Depth.
					Miles.	*Feet.*	*Feet.*
East Bench canal	------	------	------	------	------	------	------
Salem Irrigation Company's canal	------	$44,160	2,208	$20.00	6	------	------
South Field Irrigation Company's canal	1867	39,600	3,300	12.00	7	------	------
City canal	------	------	------	------	*a* 3	------	------
Spanish Fork Municipal Corporation canal	1850	------	------	------	------	------	------
Southeast Field Irrigation Company's canal	1865	------	------	------	------	------	------
Spanish Fork West Field Irrigation Company's canal	1865	------	------	------	------	------	------
Lake Shore canal	------	------	------	------	------	------	------

a Length of main canal, exclusive of laterals.

Duty of water of Spanish Fork canals in 1899.

Name of canal.	Measurements.		Length of irrigation period.	Duty of water.			
	Date.	Discharge.		Area irrigated.	Amount used.		Depth.
	1899.	*Sec.-ft.*		*Acres.*	*Sec.-ft.*	*Acre-ft.*	*Feet.*
East Bench canal	May 11	80.47	------	------	------	------	------
Do	Aug. 22	28.19	May 1 to Sept. 15	5,000	54.30	15,940	3.19
Salem Irrigation Company's canal	----do----	22.05	-----do-----	2,208	22.05	6,473	2.93
South Field Irrigation Company's canal	----do----	37.39	-----do-----	4,000	37.39	10,976	2.74
City canal	----do----	38.51	-----do-----	6,500	38.51	11,307	1.74

AMERICAN FORK.

Beginning at the north end, the first river entering Utah Valley is the American Fork. This stream is probably the third in importance. It rises in the northeastern part of Utah County, on the western slope

of the Wasatch Mountains, and flows in a southwesterly direction into Utah Lake. The water is used for power and for irrigation purposes. It is very cold and is perfectly transparent as it emerges from the deep canyon into the valley. The power plant is above the headworks of the canals, and all of the water reenters the river before any is diverted for irrigation purposes. All of the water in the river is diverted at the mouth of the canyon into three canals, namely, the Lehi canal, the American Fork canal, and the Pleasant Grove canal. A crib weir is placed across and at right angles to the river bed, being held in place by rock filling. The upper side of the weir is made impervious by planking and earth filling. Near the top of the weir are four rectangular openings, which allow the water to flow into the respective canals, two of the openings being for the American Fork canal. The admission of water is regulated by means of flashboards. The waters of the American Fork are divided as follows: Lehi canal, one-third from July 1 to September 20, one-sixth from September 20 to July 1; American Fork canal, eight twenty-firsts during the irrigation period; Pleasant Grove canal, two-sevenths from April 15 to September 20, and from September 20 to April 15 only sufficient for culinary purposes.

Lehi canal.—This canal is on the north side of the canyon, and has a westerly course to Lehi, a distance of 5 miles. A shortage of water occurs each year, due to an insufficient amount in the river.

American Fork canal.—This canal receives its water through the middle portion of the river weir. The direction of the canal is southwest, following the old river bed the greater part of the distance to the city of American Fork. The water is under the control of that city. The rights were acquired by appropriation. They belong to the land for which the water was appropriated and can not be transferred. There has always been a shortage of water, not more than half the necessary quantity being available, but there has been no litigation on that account, probably because the distribution is under municipal control.

Pleasant Grove canal.—This canal receives its water from the south opening in the American Fork weir. The direction of the canal is southeasterly to Pleasant Grove. It irrigates the city lots of Pleasant Grove and the fields in that vicinity.

Duty of water of American Fork canals in 1899.

Name of canal.	Measurements.		Length of irrigation period.	Duty of water.			
	Date.	Discharge.		Area irrigated.	Amount used.		Depth.
	1899.	*Sec.-ft.*		*Acres.*	*Sec.-ft.*	*Acre-ft.*	*Feet.*
Lehi canal	Aug. 25	17.82	Apr. 1 to Sept. 20				
American Fork canal	May 9	73.91	do	7,000			
Do	Aug. 25	28.85			51.38	17,631	2.52
Pleasant Grove canal	May 9	39.40					
Do	Aug. 25	10.71	Apr. 1 to Sept. 20	5,000	25.05	8,596	1.72

HOBBLE CREEK.

Hobble Creek enters Utah Valley at about the center of its eastern side, and irrigates the land in Springville and the immediate vicinity.

All of the canals diverting water from the creek are under the control of the city of Springville. A water privilege consists of the right to use a certain amount of water, apportioned by the water master, for three hours per acre each three weeks. These rights were acquired by appropriation, and can not be transferred from one party to another except by a transfer of the land. The chief water master is appointed by the city council for the term of one year. He in turn appoints sub water masters, who divide the water among the irrigators of their respective districts.

There is an annual tax of 6 cents per acre watered, to meet the expenses of the system. Usually there are six applications of the water to the land each year, some crops requiring more and some less than that number.

Nearly every year prior to 1899 there has been a shortage in the canals diverting water from Hobble Creek, but there has never been any litigation in consequence of the shortage. When the water becomes low in the latter part of the season the irrigators having the titles of most recent dates are deprived of the use of the water, all of which is reserved for those having prior rights.

Mapleton Reservoir canal.—This is the uppermost canal diverting water from Hobble Creek. It heads a short distance above the mouth of the canyon. It was constructed in 1878, by the appropriators. In the spring of 1899 it was bought by the city of Springville for $750, under an agreement which gave the former owners an equal right with the remainder of the Springville irrigators.

Mapleton Union canal.—This is the second canal diverting water from Hobble Creek. It takes its water from the south side of the stream. It was built in 1853 and went under the control of the city in 1877.

North Bench canal.—This is the third canal diverting water from the creek, and the uppermost on the north side. It was built in 1852. The seepage into it from the hillside was found to be 0.04 second-foot in a distance of three-fourths of a mile.

Island canal.—This is the fourth canal diverting water from the creek. It is taken out on the north side, and was constructed in 1851.

Sage Creek canal.—This is the fifth canal diverting water from the creek. It is on the south side of the stream. It was constructed in 1860, by the labor of the appropriators.

South Big Field ditch.—This canal diverts water from the north side of the creek. It was constructed in 1861.

City ditch.—This is the lowest ditch diverting water from Hobble Creek. It was constructed in 1850, by the labor of the owners.

Data regarding Hobble Creek canals.

Name of canal.	Year of appropriation.	Length of canal.
		Miles.
Mapleton Reservoir canal	1878	0.75
Mapleton Union canal	1868	3.0
North Bench canal	1852	3.0
Island canal	1851	1.0
Sage Creek canal	1860	1.5
South Big Field ditch	1851	2.0
City ditch	1850	1.0

Duty of water of Hobble Creek canals in 1899.

Name of canal.	Measurements.		Length of irrigation period.	Duty of water.			
	Date.	Discharge.		Area irrigated.	Amount used.		Depth.
	1899.	*Sec.-feet.*		*Acres.*	*Sec.-ft.*	*Acre-ft.*	*Feet.*
Mapleton Reservoir canal	May 10	7.87	May 1 to Sept. 15	100			
Do	Aug. 21	3.09					
Mapleton Union canal	May 10	26.14					
Do	Aug. 21	17.95 19.11	May 1 to Sept. 15	2,400	22.12	6,055	2.52
North Bench canal	May 10	11.65					
Do	Aug. 21	8.39	May 1 to Sept. 15	800	10.00	2,737	2.72
Island canal	....do....	4.02	.....do.....	250	4.02	1,101	4.40
Sage Creek canal	....do....	5.96	.....do.....	500	5.96	1,631	3.26
South Big Field ditch	....do....	5.52	.....do.....	800	5.52	1,511	1.89
City ditch	....do....	2.21	.....do.....	400	2.21	605	1.51

PETEETNETR CREEK.

Perhaps the best and most complete irrigation system in Utah Valley is that of Peteetnetr Creek. This stream has its source near the top of the high mountains north of Mount Nebo, about 10 miles southeast of Payson. At the head of the creek and its branches are five reservoirs. The largest covers 30 acres and has a mean depth of 10 feet; the next largest covers 25 acres and has a mean depth of 10 feet; the others cover from 7 to 10 acres each, with mean depths of from 5 to 7 feet. The dams are all of earth. The construction of the largest reservoir is under the charge of Mr. R. C. Gemmel, State engineer of Utah. The reservoirs were begun in 1887, but no benefits were derived from them until 1891. They are fed principally by the flood waters that occur during the spring, the springs flowing to them being small. The reservoirs and the creek are under the control of the city of Payson. There is an annual tax, for the maintenance of the system and the payment of the water master, of 25 cents per acre for farms and 65 cents per acre for city lots. The water of the creek and the reservoirs is divided into seventeen streams, through seventeen Cippoletti weirs, and the water of the streams is distributed on a time basis. The area irrigated is 1,400 acres. The flow of the creek is measured above all diversions over a rectangular weir with 12 feet length of crest.

Measurements over weir on Peteetnetr Creek in 1899.

Date.	Depth of water.	Discharge.	Discharge for month.	Depth for month.
1899.	*Feet.*	*Sec.-ft.*	*Acre-ft.*	*Feet.*
May 1	0.6667	21.3	4,396	3.14
May 15	2.1667	121.8		
June 1	1.4167	65.2		
June 15	.8333	29.7	2,826	2.02
July 1	.7083	23.3		
July 15	.6667	21.3	1,371	.98
August 1	.5729	17.0		
August 15	.5417	15.6	1,002	.71

NOTE.—The number of acre-feet and the depth are greater than those actually used, the measurements being made a great distance from the land to which the water was applied, and there being considerable loss by seepage and evaporation.

The water of the creek was appropriated in 1851. The water master, appointed by the city council, attends to the general division of the water at the weirs. When necessary he appoints sub water masters to attend to the subdivision. At the beginning of each irrigation season the water master issues to each irrigator a schedule stating the time at which he is to take the water for each turn during the entire season. There has not been a shortage of water on this stream since 1888, and there has been no litigation on account of shortage.

The principal crops raised are wheat, oats, potatoes, fruit, and sugar beets. Of the last, 160 acres were raised in 1898, the average yield being 18 tons per acre. This would make a total of 2,880 tons, the value of which, at $3.75 per ton, would be $10,800, or $67.50 per acre.

CURRENT CREEK.

This creek heads near the western base of Mount Nebo. Its general course is north. It is about 12 miles long, and empties into Utah Lake at the extreme southern end.

Its waters are impounded by a dam placed across the channel about 1 mile west of Goshen. This reservoir is used as a distribution basin, from which seven canals receive their supply of water. The creek irrigates about 2,500 acres. The irrigation period extends from April 1 to October 1.

On the west side of Mount Nebo, in the south end of Utah County, in what is known as Mona Valley, is the Mount Nebo Land and Irrigation Company's reservoir, which when full covers about 2,000 acres to a mean depth of 12 feet, and is supplied by the winter flow of Current Creek. The dam is built of selected and graded earth. The top length is 215 feet, the bottom length 125 feet. The bottom width is 101 feet, the top width 10 feet, the height 25 feet. About 25 feet down the lower slope there is a 3-foot berm. The entire dam is covered with riprap. The outlet tunnel is cut through the solid rock, about 37 feet below the surface. The valves are of the kind known as the butterfly valve—fastened to vertical shafts and operated from the valve house by a worm gear. The spillway is cut through the solid rock around the northern end of the dam. It is 25 feet wide, 5 feet deep, 200 feet long, and its crest is 5 feet below the top of the dam. The water is drawn off and emptied into the old creek bed below the dam, and is carried down the canyon about 2 miles to the division gates, where the reservoir water is diverted into the canal of the Mount Nebo Irrigation Company, and the natural flow of the stream is allowed to pass down the old channel. The water of the Mount Nebo Irrigation Company is conducted by a semicircular stave flume the greater part of the distance down the canyon. One crossing of the canyon is made on a trestle and another by means of an inverted siphon. At each end of the siphon the flume is gradually

contracted into the pipe. In 1899 the water from this reservoir irrigated about 2,100 acres, but there was only about five-sixths of the quantity necessary to mature the crops. There are about 10,000 acres of land tributary to the canal.

SUMMIT CREEK.

Summit Creek rises in the tops of the mountains on the south-central side of Utah Valley. Its course is northwest, and its length about 8 miles. The first and only measurement of the stream made by the writer was on August 23, 1899. The discharge at that time was 14.64 second-feet. The stream is owned and controlled by the Santaquin Irrigation and Canal Company, which was incorporated in 1875. The irrigation season is from April 1 to October 25.

GOSHEN WARMSPRINGS CREEK.

This creek rises in the level of Goshen Valley—adjacent to Utah Valley at the extreme southern end—near the base of the Nebo Range, and irrigates land on the east side of Goshen Valley. On August 23, 1899, the aggregate discharge of the streams, three in number, was estimated to be 5.5 second-feet, which was an average of the flow for the season. The number of acres irrigated is 825. The irrigation season extends from April 1 to October 1, or 183 days. The total discharge during that time would be 2,006 acre-feet, which would cover the 825 acres to a depth of 2.42 feet. The crops raised are meadow hay, alfalfa, and grain.

ROCK CANYON CREEK.

This stream flows from a deep canyon northeast of the city of Provo, and irrigates land lying between the foot of the mountains and the Timpanogas canal. The irrigation season extends from April 1 to September 1. The mean discharge during the irrigation season is nearly 4 second-feet, or a total of 1,214 acre-feet. The area irrigated is 400 acres, which would be covered to a depth of 3.04 feet. The soil consists of a gravel and sand wash. The crops raised are grain and alfalfa.

SPRING LAKE CREEK.

This creek has its source in a small lake or pond which covers 20 acres to a mean depth of 4 feet. It is used as a storage reservoir and also as a means of raising the water sufficiently to irrigate the higher land. A measurement of the stream was made on August 23, 1899, the discharge being 2.89 second-feet. The number of acres irrigated is 150.

RATING TABLES.

The following pages contain the rating tables for the various river stations described in Water-Supply Papers Nos. 47 to 51, inclusive. In each case the table shows the relation which has been found to exist during the year 1900 between the height of water on the gage and the discharge in cubic feet per second. The tables have been prepared from measurements made during 1900 or previous years, and are used in computing the daily flow, the results of which will be published in the Twenty-second Annual Report, Part IV.

Referring to the tables, the numbers in parentheses in the box heads are the pages in the Water-Supply Papers of the series for 1900 (Nos. 47 to 51, inclusive) on which the various gaging stations are described. At the end of the descriptions are given the results of discharge measurements made during 1900 and the daily gage heights. From these and earlier data the relation of gage height to discharge has been deduced. Take, for example, the first table—Delaware River at Lambertville, New Jersey. On page 80 of Water-Supply Paper No. 47 is given the daily gage height, in feet, at that station during the year 1900. On March 1 the gage height was 5.40 feet. The flow equivalent to that gage height is shown in the following table to be 20,300 second-feet. With the gage heights and the rating tables at hand, the daily and monthly flow of any stream can easily be determined. The latter (the monthly discharge) has been worked up for most of the stations maintained by the Survey, and will, as already stated, be published in the Twenty-second Annual Report, Part IV.

Rating tables for stations in New Jersey, Pennsylvania, Maryland, and West Virginia.

[Numbers in box heads refer to pages in Water-Supply Papers Nos. 47 and 48.]

Gage height, in feet.	Discharge, in second-feet.											
	Delaware River at Lambertville, N. J. (80).	North Branch of Susquehanna River at Wilkesbarre, Pa. (110).	North Branch of Susquehanna River at Danville, Pa. (111).	West Branch of Susquehanna River at Allenwood, Pa. (111).	Juniata River at Newport, Pa. (112).	Susquehanna River at Harrisburg, Pa. (113).	Patapsco River at Woodstock, Md. (115).	North Branch of Potomac River at Piedmont, W. Va. (115).	Antietam Creek near Sharpsburg, Md. (117).	North Branch of Shenandoah River near Riverton, Va. (118).	Shenandoah River at Millville, W. Va. (120).	Potomac River at Point of Rocks, Md. (121).
0.0	.....	.....	.....	.....	.....	2,500	.....	.....	.....	.....	.....	.....
.2	.....	.....	.....	.....	.....	3,230	.....	.....	.....	.....	.....	1,000
.4	.....	.....	.....	.....	.....	4,020	.....	.....	.....	.....	540	1,400
.6	.....	.....	.....	.....	.....	4,820	.....	.....	.....	.....	740	1,860
.8	.....	.....	.....	.....	.....	5,720	.....	.....	.....	.....	940	2,360
1.0	.....	.....	.....	.....	.....	6,880	.....	.....	.....	.....	1,140	2,900
1.2	.....	.....	.....	300	.....	8,150	.....	.....	38	.....	1,370	3,600
1.4	.....	.....	.....	500	.....	9,450	.....	.....	60	.....	1,650	4,300
1.6	.....	.....	825	750	.....	10,750	.....	.....	95	.....	1,950	5,100
1.8	.....	.....	1,100	1,050	.....	12,300	.....	34	154	.....	2,260	6,020
2.0	.....	.....	1,400	1,350	.....	13,900	.....	77	217	.....	2,600	7,000
2.2	.....	1,000	1,800	1,700	.....	15,500	.....	124	281	.....	2,960	7,980
2.4	1,750	1,200	2,250	2,150	.....	17,300	.....	175	348	.....	3,340	8,960
2.6	2,100	1,400	2,750	2,650	350	19,300	.....	230	416	140	3,740	9,940
2.8	2,600	1,600	3,300	3,250	600	21,300	.....	289	485	240	4,160	10,920
3.0	3,300	1,860	3,900	4,000	1,000	23,400	50	352	560	380	4,600	11,900
3.2	4,100	2,120	4,550	5,200	1,400	25,625	83	430	665	580	5,060	13,040
3.4	5,050	2,400	5,250	7,500	1,820	27,925	122	525	775	805	5,540	14,240
3.6	6,100	2,700	6,000	10,750	2,270	30,300	173	640	887	1,035	6,050	15,460
3.8	7,250	3,000	6,800	14,000	2,750	32,800	235	775	1,001	1,265	6,600	16,680
4.0	8,550	3,300	7,650	17,250	3,250	35,400	310	920	1,215	1,495	7,190	17,900
4.2	10,000	3,600	8,575	20,500	3,750	38,100	400	1,080	1,329	1,725	7,790	19,120
4.4	11,650	3,940	9,525	23,750	4,300	41,100	520	1,240	1,443	1,955	8,410	20,340
4.6	13,350	4,340	10,500	27,000	4,900	44,590	670	1,400	1,557	2,185	9,040	21,560
4.8	15,050	4,760	11,500	30,250	5,500	48,170	830	1,560	1,671	2,415	9,680	22,780
5.0	16,750	5,200	12,550	33,500	6,200	51,750	1,000	1,720	1,785	2,645	10,320	24,000
5.2	18,500	5,700	13,720	36,750	6,900	55,330	1,200	1,880	.....	2,875	10,960	25,220
5.4	20,300	6,250	14,900	40,000	7,700	58,910	1,400	2,040	.....	3,105	11,600	26,440
5.6	22,150	6,850	16,100	43,250	8,500	62,490	1,600	2,200	.....	3,335	12,240	27,660
5.8	24,050	7,560	17,390	46,500	9,350	66,070	1,800	2,360	.....	3,565	12,880	28,880
6.0	25,950	8,340	18,800	49,750	10,250	69,650	2,000	2,520	.....	3,795	13,520	30,100
6.2	27,850	9,240	20,240	53,000	11,150	73,230	2,205	2,680	.....	4,025	14,160	31,400
6.4	29,750	10,260	21,680	56,250	12,060	76,810	2,410	2,840	.....	4,255	14,800	32,700
6.6	31,700	11,360	23,120	59,500	13,000	80,390	2,615	3,000	.....	4,485	15,440	34,100
6.8	33,710	12,480	24,560	62,750	14,000	83,970	2,820	3,160	.....	4,715	16,080	35,500
7.0	35,750	13,600	26,000	66,000	15,000	87,550	3,025	3,320	.....	4,945	16,720	36,950
7.5	40,900	16,400	29,660	74,125	17,500	96,500	3,538	3,720	.....	5,520	.....	40,800
8.0	46,050	19,200	33,200	82,250	20,000	105,450	4,050	4,120	.....	.....	.....	44,900
8.5	51,200	22,000	36,800	90,375	22,500	114,400	4,562	4,520	.....	.....	.....	49,300
9.0	56,350	24,800	40,400	98,500	25,000	123,350	.....	4,920	.....	.....	.....	53,850
9.5	61,500	27,600	44,000	106,625	27,500	132,300	.....	.....	.....	.....	.....	58,400
10.0	.....	30,400	47,600	114,750	30,000	141,250	.....	.....	.....	.....	.....	62,950
10.5	.....	33,200	51,200	122,875	32,500	150,200	.....	.....	.....	.....	.....	67,500
11.0	.....	36,000	54,800	131,000	35,000	159,150	.....	.....	.....	.....	.....	72,050
11.5	.....	38,800	58,400	139,125	.....	168,100	.....	.....	.....	.....	.....	76,600
12.0	.....	41,600	62,000	147,250	.....	177,050	.....	.....	.....	.....	.....	81,150
12.5	.....	44,400	.....	155,375	.....	186,000	.....	.....	.....	.....	.....	85,700
13.0	.....	47,200	.....	163,500	.....	194,950	.....	.....	.....	.....	.....	90,250
13.5	.....	50,000	.....	.....	.....	203,900	.....	.....	.....	.....	.....	94,800
14.0	.....	52,800	.....	.....	.....	212,850	.....	.....	.....	.....	.....	99,350
14.5	.....	55,600	.....	.....	.....	221,800	.....	.....	.....	.....	.....	103,900
15.0	.....	58,400	.....	.....	.....	230,750	.....	.....	.....	.....	.....	108,450
15.5	.....	61,200	.....	.....	.....	239,700	.....	.....	.....	.....	.....	113,000
16.0	.....	64,000	.....	.....	.....	248,650	.....	.....	.....	.....	.....	117,550
16.5	.....	66,800	.....	.....	.....	257,600	.....	.....	.....	.....	.....	122,100
17.0	.....	69,600	.....	.....	.....	266,550	.....	.....	.....	.....	.....	126,650

Rating tables for stations in Maryland, Virginia, North Carolina, and South Carolina.

[Numbers in box heads refer to pages in Water-Supply Paper No. 48.]

Gage height, in feet.	Discharge, in second-feet.											
	Monocacy River near Frederick, Md. (125).	North (of James) River at Glasgow, Va. (127).	James River at Buchanan, Va. (128).	James River at Cartersville, Va. (128).	Roanoke River at Roanoke, Va. (130).	Roanoke River at Neal, N. C. (131).	Tar River at Tarboro, N. C. (134).	Neuse River at Selma, N. C. (135).	Cape Fear River at Fayetteville, N. C. (137).	Yadkin River at Salisbury, N. C. (139).	Catawba River at Rockhill, S. C. (144).	Broad River (of the Carolinas) near Alston, S. C. (146).
0.2	.....	.....	.....	.....	.....	1,440	*a* 290	*b* 150	.....	.....	.....	.....
.4	.....	.....	.....	720	55	1,560	350	184	330	.....	.....	.....
.6	.....	.....	.....	910	85	1,680	410	218	375	.....	.....	.....
.8	.....	280	.....	1,150	120	1,800	480	252	429	.....	.....	.....
1.0	.....	350	.....	1,420	170	1,920	550	290	489	.....	.....	.....
1.2	.....	450	.....	1,730	240	2,050	620	330	550	1,040	.....	.....
1.4	.....	580	.....	2,060	325	2,180	690	370	612	1,300	1,550	.....
1.6	.....	720	310	2,420	420	2,310	760	413	678	1,560	1,750	.....
1.8	.....	890	360	2,800	540	2,440	840	459	744	1,870	2,030	1,210
2.0	.....	1,090	430	3,200	670	2,580	920	505	810	2,250	2,390	1,470
2.2	.....	1,300	540	3,600	820	2,720	1,000	555	876	2,750	2,830	1,735
2.4	.....	1,520	670	4,000	1,010	2,860	1,080	605	946	3,250	3,380	2,010
2.6	.....	1,750	840	4,410	1,240	3,000	1,160	658	1,022	3,790	4,060	2,300
2.8	.....	1,990	1,050	4,830	1,540	3,140	1,240	714	1,103	4,370	4,880	2,720
3.0	.....	2,240	1,330	5,260	1,920	3,280	1,320	770	1,187	4,950	5,750	3,160
3.2	.....	2,500	1,650	5,700	2,325	3,420	1,400	830	1,273	5,610	6,632	3,620
3.4	.....	2,760	1,980	6,140	2,735	3,560	1,480	890	1,367	6,285	7,516	4,080
3.6	45	3,020	2,330	6,580	3,145	3,700	1,565	951	1,467	6,990	8,400	4,540
3.8	90	3,300	2,690	7,040	3,555	3,840	1,655	1,013	1,567	7,720	9,284	5,000
4.0	150	3,590	3,050	7,520	3,965	3,980	1,745	1,075	1,674	8,450	10,168	5,460
4.2	210	3,890	3,440	8,010	4,375	4,120	1,845	1,141	1,782	9,270	11,052	5,920
4.4	270	4,190	3,840	8,520	4,785	4,260	1,945	1,207	1,890	10,100	11,936	6,410
4.6	340	4,490	4,240	9,040	5,195	4,400	2,045	1,274	1,994	10,960	12,820	6,910
4.8	420	4,810	4,640	9,560	5,605	4,540	2,155	1,342	2,102	11,880	13,704	7,410
5.0	500	5,130	5,060	10,080	6,015	4,680	2,265	1,410	2,210	12,800	14,588	7,910
5.5	750	6,010	6,060	11,380	7,040	5,055	2,565	1,590	2,470	15,250	16,798	9,200
6.0	1,020	6,910	7,210	12,680	8,065	5,430	2,865	1,780	2,740	18,000	19,008	11,000
6.5	1,450	7,870	8,410	14,030	9,090	5,830	3,205	1,980	3,010	21,000	21,218	13,135
7.0	1,880	8,900	9,660	15,380	10,115	6,230	3,580	2,190	3,280	24,060	23,428	15,270
7.5	2,310	9,970	10,910	16,730	11,140	6,705	3,955	2,415	3,550	27,130	25,638	17,420
8.0	2,740	11,070	12,190	18,080	12,165	7,200	4,330	2,645	3,822	30,425	27,848	19,570
8.5	3,170	.....	13,490	.....	.....	7,700	4,745	2,895	4,102	33,750	30,058	21,745
9.0	3,600	.....	14,790	.....	.....	8,200	5,160	3,160	4,382	37,125	32,268	23,920
9.5	4,030	.....	16,090	.....	.....	8,730	5,575	3,435	4,672	40,500	34,478	26,095
10.0	4,460	.....	17,420	.....	.....	9,280	5,990	3,710	4,955	43,950	36,688	28,270
10.5	4,890	.....	18,770	.....	.....	9,830	6,405	4,000	5,245	47,560	38,898	30,520
11.0	5,320	.....	20,120	.....	.....	10,380	6,820	4,305	5,535	51,250	41,108	32,770
11.5	5,750	.....	21,520	.....	.....	10,955	7,235	4,630	5,833	55,000	43,318	35,020
12.0	6,180	.....	22,920	.....	.....	11,530	7,650	4,965	6,133	58,750	45,528	37,270
12.5	6,610	.....	24,320	.....	.....	12,105	8,070	5,325	6,433	62,625	.....	39,520
13.0	7,040	.....	25,720	.....	.....	12,680	8,490	5,700	6,733	66,525	.....	41,770
13.5	7,470	.....	27,120	.....	.....	13,255	8,925	6,075	7,033	70,425	.....	44,020
14.0	7,900	.....	28,530	.....	.....	13,830	9,370	6,465	7,333	74,325	.....	46,270
14.5	8,330	.....	29,930	.....	.....	14,405	9,820	6,855	7,633	78,375	.....	48,520
15.0	8,760	.....	31,330	.....	.....	15,000	10,270	7,250	7,933	82,500	.....	50,770
16.0	9,620	.....	34,130	.....	.....	16,200	11,170	8,050	8,541	91,000	.....	55,270
17.0	10,480	.....	.....	.....	.....	17,430	12,070	8,880	9,161	99,600	.....	59.770
18.0	11,340	.....	.....	.....	.....	18,680	12,970	9,710	9,781	108,200	.....	64,270
19.0	.....	.....	.....	.....	.....	20,080	13,870	10,540	10,401	116,800	.....	68,770
20.0	.....	.....	.....	.....	.....	22,000	14,850	11,370	11,569	.....	.....	73,270
25.0	.....	.....	.....	.....	.....	40,400	.....	.....	18,364	.....	.....	.....
30.0	.....	.....	.....	.....	.....	.....	.....	.....	25,159	.....	.....	.....
35.0	.....	.....	.....	.....	.....	.....	.....	.....	33,600	.....	.....	.....
40.0	.....	.....	.....	.....	.....	.....	.....	.....	44,000	.....	.....	.....
45.0	.....	.....	.....	.....	.....	.....	.....	.....	54,500	.....	.....	.....
50.0	.....	.....	.....	.....	.....	.....	.....	.....	65,000	.....	.....	.....

a Continued: Gage height −0.2, discharge 134; gage height 0.0, discharge 230.
b Continued: Gage height −0.2, discharge 113; gage height 0.0, discharge 120.

Rating tables for stations in South Carolina and Georgia.

[Numbers in box heads refer to pages in Water-Supply Paper No. 48.]

Gage height, in feet.	Discharge, in second-feet.												
	Salnda River at Waterloo, S. C. (147).	Tallulah River at Tallulah Falls, Ga. (148).	Tugaloo River near Madison, S. C. (149).	Savannah River near Calhoun Falls, S.C. (149).	Savannah River at Augusta, Ga. (150).	Broad River (of Georgia) near Carlton, Ga. (151).	Oconee River near Dublin, Ga. (152).	Yellow River at Almon, Ga. (153).	Towaliga River near Juliette, Ga. (154).	Ocmulgee River at Macon, Ga. (155).	Flint River at Woodbury, Ga. (157).	Chattahoochee River at Oakdale, Ga. (158).
−0.8	.....	.....	.....	.....	.....	.....	*a* 1,015	.....	.....	.....	.....	.....
.6	.....	.....	.....	.....	.....	.....	1,095	.....	.....	.....	.....	.....
.4	.....	.....	.....	.....	.....	.....	1,185	.....	.....	.....	.....	.....
.2	.....	.....	.....	.....	.....	.....	1,300	.....	.....	.....	.....	.....
.0	.....	.....	.....	.....	.....	.....	1,425	.....	.....	.....	350	.....
.2	.....	.....	.....	.....	.....	.....	1,552	.....	.....	.....	400	910
.4	.....	.....	.....	.....	.....	.....	1,681	.....	.....	.....	460	1,000
.6	.....	160	.....	.....	.....	.....	1,812	.....	.....	.....	530	1,100
.8	.....	200	.....	.....	.....	.....	1,945	.....	.....	.....	650	1,220
1.0	.....	252	.....	.....	.....	.....	2,080	.....	126	.....	800	1,350
1.2	.....	313	705	.....	.....	.....	2,218	.....	135	940	1,000	1,496
1.4	.....	385	775	.....	.....	.....	2,358	200	154	1,040	1,245	1,630
1.6	.....	470	845	.....	.....	380	2,500	230	177	1,140	1,500	1,780
1.8	.....	580	920	.....	.....	450	2,644	260	204	1,250	1,780	1,940
2.0	300	700	1,000	1,760	.....	540	2,790	290	237	1,360	2,060	2,100
2.2	320	840	1,090	1,990	.....	660	2,938	330	273	1,480	2,340	2,270
2.4	340	980	1,180	2,280	.....	800	3,089	370	309	1,600	2,620	2,450
2.6	360	1,120	1,275	2,690	.....	940	3,243	410	345	1,720	2,900	2,630
2.8	380	1,260	1,375	3,150	.....	1,080	3,400	455	381	1,840	3,180	2,810
3.0	405	1,400	1,475	3,900	.....	1,220	3,560	505	417	1,960	3,460	3,000
3.2	450	1,540	1,580	4,770	.....	1,370	3,720	555	453	2,080	3,740	3,200
3.4	510	1,680	1,690	5,640	.....	1,520	3,890	605	489	2,200	4,020	3,405
3.6	600	1,820	1,800	6,510	.....	1,680	4,070	660	525	2,320	4,300	3,615
3.8	720	1,960	1,920	7,380	.....	1,840	4,260	720	561	2,440	4,580	3,825
4.0	850	2,100	2,060	8,250	2,350	2,000	4,460	780	597	2,560	4,860	4,035
4.2	980	.....	2,220	9,120	2,470	2,180	4,672	850	633	2,680	5,140	4,250
4.4	1,110	.....	2,380	9,990	2,695	2,360	4,888	920	669	2,800	5,420	4,470
4.6	1,240	.....	2,540	10,860	2,725	2,550	5,108	990	705	2,920	5,700	4,700
4.8	1,375	.....	2,700	11,735	2,860	2,750	5,332	1,080	741	3,040	5,980	4,930
5.0	1,515	.....	2,860	12,600	3,000	2,950	5,560	1,175	777	3,160	6,260	5,160
5.2	1,660	.....	3,020	13,470	3,160	3,160	5,788	1,275	813	3,280	6,540	5,420
5.4	1,820	.....	3,180	14,340	3,340	3,390	6,016	1,375	849	3,400	6,820	5,700
5.6	1,980	.....	3,340	15,210	3,540	3,640	6,244	1,480	885	3,520	7,100	6,000
5.8	2,140	.....	3,500	16,080	3,760	3,900	6,472	1,585	921	3,640	7,380	6,300
6.0	2,300	.....	3,660	16,950	4,000	4,160	6,700	1,690	957	3,760	7,660	6,600
6.5	2,700	.....	4,060	19,125	4,620	4,825	7,270	1,958	1,047	4,060	8,360	7,350
7.0	3,100	.....	4,460	21,300	5,300	5,500	7,840	2,227	1,137	4,360	9,060	8,100
7.5	3,500	.....	4,860	23,475	6,050	6,175	8,410	2,495	1,227	4,660	9,760	8,850
8.0	3,900	.....	5,260	25,650	6,800	6,850	8,980	2,763	1,317	5,010	10,460	9,600
8.5	4,300	.....	5,660	27,825	7,600	7,525	9,550	3,031	1,407	5,410	11,160	10,350
9.0	4,700	.....	6,060	30,000	8,400	8,200	10,120	3,300	1,497	5,810	11,860	11,100
9.5	5,100	.....	6,460	32,175	9,250	8,875	10,690	3,568	1,587	6,250	.....	11,850
10.0	5,500	.....	6,860	34,350	10,100	9,550	11,260	3,837	1,677	6,820	.....	12,600
11.0	6,300	.....	7,660	38,700	11,900	10,900	12,400	4,375	1,857	8,020	.....	14,100
12.0	7,100	.....	8,460	43,050	13,800	12,250	13,540	4,912	2,037	9,400	.....	15,600
13.0	8,100	.....	9,260	47,400	15,800	13,600	14,680	5,450	2,217	11,240	.....	17,100
14.0	9,100	.....	10,060	51,750	17,900	14,950	15,820	5,987	2,397	13,900	.....	18,600
15.0	10,100	.....	10,860	56,100	20,100	16,300	16,960	6,525	2,577	18,100	.....	20,100
16.0	11,100	.....	11,660	.....	22,400	17,650	18,100	.....	2,757	22,300	.....	21,600
18.0	13,100	.....	.....	.....	27,300	.....	20,380	.....	.....	30,700	.....	24,600
20.0	15,100	.....	.....	.....	33,300	.....	22,660	.....	.....	.....	.....	.....
22.0	.....	.....	.....	.....	41,000	.....	24,940	.....	.....	.....	.....	.....
24.0	.....	.....	.....	.....	52,000	.....	27,220	.....	.....	.....	.....	.....
26.0	.....	.....	.....	.....	68,800	.....	.....	.....	.....	.....	.....	.....
28.0	.....	.....	.....	.....	86,400	.....	.....	.....	.....	.....	.....	.....
30.0	.....	.....	.....	.....	104,000	.....	.....	.....	.....	.....	.....	.....

a Continued: Gage height −1.2, discharge 890; gage height −1.0, discharge 950.

Rating tables for stations in Georgia, Alabama, Maryland, and Virginia.

[Numbers in box heads refer to pages in Water-Supply Paper No. 48.]

Gage height, in feet.	Discharge, in second-feet.											
	Chattahoochee River at West Point, Ga. (159).	Etowah River at Canton, Ga. (160).	Coosawattee River at Carters, Ga. (161).	Oostanaula River at Resaca, Ga. (162).	Coosa River at Rome, Ga. (163).	Coosa River near Riverside, Ala. (164).	Tallapoosa River near Susanna, Ala. (166).	Tallapoosa River near Milstead, Ala. (168).	Black Warrior River at Tuscaloosa, Ala. (170).	Big Sandy Creek near Dadeville, Ala. (174).	Youghiogheny River at Friendsville, Md. (176).	New River at Radford, Va. (178).
−0.4	.....	275	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
− .2	.....	385	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.0	.....	515	.....	.....	.....	.....	.....	.....	280	.....	.....	1,400
.2	.....	665	.....	.....	.....	.....	.....	.....	340	.....	.....	1,800
.4	.....	820	.....	.....	.....	.....	.....	.....	400	.....	.....	2,220
.6	.....	988	.....	.....	.....	.....	.....	.....	460	.....	.....	2,700
.8	.....	1,154	.....	.....	1,930	.....	.....	.....	530	.....	.....	3,250
1.0	935	1,320	.....	460	2,110	2,460	.....	.....	600	110	.....	3,860
1.2	1,000	1,486	425	500	2,350	2,760	.....	.....	670	200	.....	4,765
1.4	1,180	1,652	495	550	2,600	3,100	1,680	.....	750	315	.....	5,715
1.6	1,380	1,818	575	600	2,850	3,500	1,960	1,450	830	465	.....	6,665
1.8	1,600	1,984	670	650	3,120	3,940	2,320	1,675	910	655	.....	7,615
2.0	1,840	2,150	765	705	3,400	4,400	2,740	1,900	1,000	870	.....	8,565
2.2	2,100	2,316	865	770	3,700	4,900	3,230	2,125	1,090	1,110	.....	9,515
2.4	2,380	2,482	970	840	4,000	5,430	3,850	2,350	1,180	1,350	.....	10,660
2.6	2,680	2,648	1,075	920	4,300	5,970	4,730	2,575	1,270	1,590	.....	11,980
2.8	3,000	2,814	1,180	1,000	4,600	6,530	5,630	2,800	1,370	1,830	.....	13,320
3.0	3,340	2,980	1,290	1,100	4,900	7,100	6,530	3,025	1,470	2,070	.....	14,680
3.2	3,700	3,146	1,400	1,220	5,230	7,700	7,430	3,250	1,570	2,310	.....	16,050
3.4	4,080	3,312	1,510	1,340	5,580	8,330	8,330	3,475	1,670	2,550	.....	17,440
3.6	4,480	3,478	1,625	1,460	5,930	8,970	9,230	3,700	1,780	2,790	20	18,840
3.8	4,920	3,644	1,750	1,580	6,300	9,620	10,130	3,925	1,890	3,030	65	20,386
4.0	5,370	3,810	1,875	1,700	6,700	10,300	11,030	4,150	2,000	3,270	130	21,890
4.2	5,880	3,976	2,010	1,820	7,102	11,000	11,930	4,375	2,111	3,510	210	.....
4.4	6,400	4,142	2,145	1,940	7,504	11,700	12,830	4,600	2,222	3,750	300	.....
4.6	6,940	4,308	2,280	2,080	7,906	12,400	13,730	4,825	2,333	.....	400	.....
4.8	7,490	4,474	2,415	2,220	8,308	13,100	14,630	5,050	2,444	.....	515	.....
5.0	8,040	4,640	2,550	2,360	8,710	13,800	15,530	5,275	2,555	.....	640	.....
5.5	9,420	5,055	2,910	2,780	9,715	15,550	17,780	5,837	2,832	.....	1,050	.....
6.0	10,800	5,470	3,270	3,230	10,720	17,300	20,030	6,400	3,110	.....	1,600	.....
6.5	12,180	5,885	3,630	3,690	11,725	19,200	22,280	6,962	3,370	.....	2,170	.....
7.0	13,560	6,300	3,990	4,150	12,730	21,100	24,530	7,525	3,665	.....	2,740	.....
7.5	14,950	6,715	4,350	4,610	13,735	23,100	.....	8,087	3,925	.....	3,310	.....
8.0	16,400	7,130	4,710	5,070	14,740	25,100	.....	8,650	4,220	.....	3,880	.....
8.5	17,850	7,545	5,070	5,530	15,745	27,100	.....	9,212	4,480	.....	4,450	.....
9.0	19,300	7,960	5,430	5,990	16,750	29,100	.....	9,775	4,775	.....	5,020	.....
9.5	20,750	8,375	5,790	6,450	17,755	31,100	.....	10,337	5,035	.....	5,590	.....
10.0	22,200	8,790	6,150	6,910	18,760	33,100	.....	10,900	5,330	.....	.....	.....
11.0	25,100	9,620	.....	7,830	20,770	37,100	.....	12,025	5,885	.....	.....	.....
12.0	28,800	10,450	.....	8,750	22,780	41,100	.....	13,150	6,440	.....	.....	.....
13.0	33,410	11,280	.....	9,670	24,790	45,100	.....	14,275	6,995	.....	.....	.....
14.0	38,030	12,110	.....	10,590	26,800	49,100	.....	15,400	7,550	.....	.....	.....
15.0	42,630	12,940	.....	11,510	28,810	53,100	.....	16,525	8,105	.....	.....	.....
16.0	.....	13,770	.....	12,430	30,820	57,100	.....	17,650	8,660	.....	.....	.....
17.0	.....	14,600	.....	13,350	32,830	61,100	.....	18,775	9,215	.....	.....	.....
18.0	.....	15,430	.....	14,270	.....	65,100	.....	19,900	9,770	.....	.....	.....
19.0	.....	.....	.....	15,190	.....	69,100	.....	21,025	10,325	.....	.....	.....
20.0	.....	.....	.....	16,110	.....	.....	.....	22,150	10,380	.....	.....	.....
25.0	.....	.....	.....	.....	.....	.....	.....	27,775	16,000	.....	.....	.....
30.0	.....	.....	.....	.....	.....	.....	.....	33,400	24,600	.....	.....	.....
35.0	.....	.....	.....	.....	.....	.....	.....	39,025	35,000	.....	.....	.....
40.0	.....	.....	.....	.....	.....	.....	.....	44,650	49,000	.....	.....	.....
45.0	.....	.....	.....	.....	.....	.....	.....	.....	65,250	.....	.....	.....
50.0	.....	.....	.....	.....	.....	.....	.....	.....	84,000	.....	.....	.....
55.0	.....	.....	.....	.....	.....	.....	.....	.....	102,750	.....	.....	.....
60.0	.....	.....	.....	.....	.....	.....	.....	.....	121,500	.....	.....	.....

Rating tables for stations in West Virginia, North Carolina, Tennessee, Georgia, and Ohio.

[Numbers in box heads refer to pages in Water-Supply Papers Nos. 48 and 49.]

Gage height, in feet.	Discharge, in second-feet.											
	Greenbrier River at Alderson, W. Va. (178).	New River at Fayette, W. Va. (181).	French Broad River near Asheville, N. C. (186).	Tuckasegee River at Bryson, N. C. (188).	Little Tennessee River at Judson, N. C. (189).	Hiwassee River at Murphy, N. C. (190).	Hiwassee River at Reliance, Tenn. (191).	Hiwassee River at Charleston, Tenn. (192).	Toccoa River near Blueridge, Ga. (193).	Tennessee River at Chattanooga, Tenn. (195).	Olentangy River at Columbus, Ohio (218).	Scioto River at Columbus, Ohio (219).
0.0	.....	1,840	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.2	.....	1,960	.....	.....	.....	.....	.....	1,200	.....	.....	.....	.....
.4	.....	2,080	.....	.....	.....	.....	.....	1,380	.....	.....	.....	.....
.6	.....	2,240	.....	.....	.....	.....	.....	1,580	.....	.....	.....	.....
.8	.....	2,400	.....	.....	.....	.....	.....	1,820	.....	6,600	.....	.....
1.0	.....	2,560	.....	300	.....	.....	1,030	2,100	.....	7,300	8	.....
1.2	60	2,750	.....	500	.....	.....	1,180	2,400	.....	8,040	55	.....
1.4	120	2,950	.....	700	.....	.....	1,415	2,710	.....	8,820	145	.....
1.6	220	3,160	.....	950	.....	.....	1,750	3,040	.....	9,620	247	.....
1.8	350	3,380	.....	1,200	.....	.....	2,100	3,370	.....	10,430	365	.....
2.0	505	3,610	800	1,510	.....	.....	2,450	3,700	255	11,250	494	.....
2.2	685	3,850	890	1,850	325	.....	2,800	4,030	318	12,080	635	.....
2.4	920	4,100	1,020	2,190	427	.....	3,150	4,360	387	12,930	795	.....
2.6	1,205	4,380	1,190	2,540	596	.....	3,500	4,690	460	13,800	978	.....
2.8	1,535	4,690	1,380	2,900	828	.....	3,850	5,020	550	14,680	1,185	.....
3.0	1,900	5,030	1,610	3,260	1,060	.....	4,200	5,350	675	15,600	1,415	.....
3.2	2,330	5,290	1,880	3,650	1,310	.....	4,550	5,680	837	16,550	1,535	.....
3.4	2,770	5,650	2,190	4,075	1,595	.....	4,900	6,010	1,035	17,550	1,850	.....
3.6	3,240	6,010	2,530	4,550	1,935	.....	5,250	6,340	1,235	18,550	2,090	.....
3.8	3,720	6,370	2,900	5,125	2,315	.....	5,600	6,670	1,435	19,600	2,330	.....
4.0	4,200	6,730	3,290	5,750	2,695	.....	5,950	7,000	1,635	20,800	2,580	.....
4.2	4,680	7,090	3,710	6,400	3,075	.....	6,300	7,330	1,835	22,040	2,850	.....
4.4	5,160	7,460	4,210	7,050	3,455	.....	6,650	7,660	2,035	23,280	3,135	.....
4.6	5,660	7,860	4,760	7,700	3,850	240	.....	7,990	.....	24,520	3,445	.....
4.8	6,180	8,260	5,350	8,350	4,250	310	.....	8,320	.....	25,760	3,789	.....
5.0	6,700	8,660	6,000	9,000	4,650	415	.....	8,650	.....	27,000	4,135	.....
5.5	8,000	9,730	7,750	10,950	5,650	745	.....	9,475	.....	30,100	5,015	.....
6.0	9,500	10,880	9,500	13,450	6,720	1,325	.....	10,300	.....	33,200	5,905	.....
6.5	11,000	12,030	11,250	16,300	7,845	2,200	.....	11,125	.....	36,300	6,795	.....
7.0	12,500	13,250	13,000	19,175	9,030	3,075	.....	11,950	.....	39,400	7,685	.....
7.5	14,000	14,530	14,750	22,050	10,420	3,950	.....	12,775	.....	42,500	.....	.....
8.0	15,600	15,830	16,500	24,925	12,200	4,825	.....	13,600	.....	45,600	.....	.....
8.5	17,300	17,130	18,250	27,800	14,200	5,700	.....	14,425	.....	48,700	.....	.....
9.0	19,000	18,480	20,000	30,675	16,200	6,600	.....	15,250	.....	51,800	.....	9
9.5	20,700	19,870	.....	33,550	18,450	7,500	.....	16,075	.....	54,900	.....	91
10.0	22,500	21,310	.....	36,425	20,700	8,400	.....	16,900	.....	58,000	.....	275
11.0	26,500	24,480	.....	42,300	27,400	10,200	.....	18,550	.....	64,200	.....	778
12.0	31,200	27,900	.....	.....	37,400	12,000	.....	20,200	.....	70,400	.....	1,440
13.0	36,200	31,500	.....	.....	48,000	13,800	.....	.....	.....	76,600	.....	2,240
14.0	41,200	35,160	.....	.....	.....	15,600	.....	.....	.....	82,800	.....	3,300
15.0	46,200	38,960	.....	.....	.....	17,400	.....	.....	.....	89,000	.....	4,580
16.0	.....	.....	.....	.....	.....	19,200	.....	.....	.....	95,200	.....	6,130
17.0	.....	.....	.....	.....	.....	21,000	.....	.....	.....	101,400	.....	8,000
18.0	.....	.....	.....	.....	.....	22,800	.....	.....	.....	107,600	.....	.....
19.0	.....	.....	.....	.....	.....	24,600	.....	.....	.....	113,800	.....	.....
20.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	120,000	.....	.....
22.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	132,400	.....	.....
24.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	144,800	.....	.....
26.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	157,200	.....	.....
28.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	169,600	.....	.....
30.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	182,000	.....	.....
32.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	194,400	.....	.....
34.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	206,800	.....	.....
36.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	219,200	.....	.....
38.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	231,600	.....	.....
40.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	244,000	.....	.....

Rating tables for stations in Montana and Wyoming.

[Numbers in box heads refer to pages in Water-Supply Paper No. 49.]

Gage height, in feet.	Discharge, in second-feet.											
	West Gallatin River near Salesville, Mont. (260).	Middle Creek near Bozeman, Mont. (261).	Gallatin River at Logan, Mont. (262).	Madison River near Redbluff, Mont. (263).	Jefferson River at Sappington, Mont. (264).	Missouri River at Townsend, Mont. (265).	Milk River at Havre, Mont. (267).	Yellowstone River near Livingston, Mont. (268).	Bighorn River near Thermopolis, Wyo. (269).	Grand Encampment Creek at Peryam's ranch, Wyo. (273).	Laramie River at Woods, Wyo. (273).	North Platte River near Guernsey, Wyo. (275).
0.0	.....	48	.....	.....	.....	*a* 1,620	.....	*b* 2,150	*c* 210	.....	.....	*d* 1,060
.2	.....	88	.....	.....	.....	1,825	.....	2,375	400	10	.....	1,340
.4	.....	153	240	.....	.....	2,090	.....	2,605	620	80	45	1,620
.6	.....	232	345	.....	.....	2,415	.....	2,855	940	195	60	1,920
.8	.....	321	460	.....	.....	2,810	.....	3,130	1,340	395	85	2,220
1.0	.....	417	605	860	.....	3,255	.....	3,420	1,770	630	125	2,520
1.2	.....	.....	765	1,230	305	3,825	.....	3,730	2,210	885	200	2,820
1.4	.....	.....	940	1,640	435	4,450	12	4,075	2,650	1,160	290	3,120
1.6	.....	.....	1,130	2,075	600	5,140	30	4,440	3,090	1,470	410	3,430
1.8	.....	.....	1,345	2,530	775	5,880	50	4,830	3,530	1,820	550	3,770
2.0	.....	.....	1,575	3,005	980	6,650	76	5,275	3,970	2,185	720	4,150
2.2	.....	.....	1,800	3,515	1,205	7,440	109	5,740	4,410	2,585	960	4,570
2.4	.....	.....	2,075	4,040	1,455	8,265	149	6,220	4,850	3,005	1,240	5,020
2.6	.....	.....	2,350	4,570	1,725	9,140	189	6,730	5,290	3,425	1,530	5,485
2.8	330	.....	2,665	5,110	2,020	10,010	248	7,270	5,730	3,845	1,820	5,955
3.0	440	.....	2,995	5,655	2,325	10,955	315	7,840	6,170	4,265	2,110	6,430
3.2	560	.....	3,335	6,220	2,645	11,825	396	8,470	6,610	4,685	2,400	6,910
3.4	700	.....	3,685	6,810	2,980	12,730	485	9,140	7,050	.....	2,690	7,390
3.6	850	.....	4,055	.....	3,330	13,690	587	9,860	7,490	.....	2,980	7,870
3.8	1,020	.....	4,425	.....	3,690	14,600	700	10,660	7,930	.....	3,270	8,350
4.0	1,200	.....	4,805	.....	4,050	15,525	820	11,540	8,370	.....	3,560	8,830
4.2	1,405	.....	.....	.....	4,410	16,460	940	12,485	8,810	.....	3,850	9,310
4.4	1,630	.....	.....	.....	4,780	17,340	1,070	13,475	9,250	.....	4,140	9,790
4.6	1,870	.....	.....	.....	5,150	.....	1,205	14,530	9,690	.....	4,430	.....
4.8	2,125	.....	.....	.....	5,520	.....	1,350	15,645	10,130	.....	.....	.....
5.0	2,395	.....	.....	.....	5,890	.....	1,500	16,875	10,570	.....	.....	.....
5.2	2,685	.....	.....	.....	6,270	.....	1,650	.....	11,010	.....	.....	.....
5.4	2,990	.....	.....	.....	6,655	.....	.....	.....	11,450	.....	.....	.....
5.6	3,300	.....	.....	.....	7,045	.....	.....	.....	.....	.....	.....	.....
5.8	3,610	.....	.....	.....	7,445	.....	.....	.....	.....	.....	.....	.....
6.0	3,925	.....	.....	.....	7,845	.....	.....	.....	.....	.....	.....	.....
6.2	4,245	.....	.....	.....	8,255	.....	.....	.....	.....	.....	.....	.....
6.4	4,570	.....	.....	.....	8,665	.....	.....	.....	.....	.....	.....	.....
6.6	4,900	.....	.....	.....	9,075	.....	.....	.....	.....	.....	.....	.....
6.8	5,240	.....	.....	.....	9,485	.....	.....	.....	.....	.....	.....	.....
7.0	5,580	.....	.....	.....	9,905	.....	.....	.....	.....	.....	.....	.....

a Eighty-eight feet should be added to the gage heights for this station, making the first gage height read 88.0 instead of 0.0; the second 88.2 instead of 0.2, and so on.

b Continued: Gage height —1.4, discharge 1,000; gage height —1.20, discharge 1,120; gage height —1.0, discharge 1,265; gage height —0.8, discharge 1,420; gage height —0.6, discharge 1,585; gage height —0.4, discharge 1,760; gage height —0.2, discharge 1,950.

c Continued: Gage height —0.2, discharge 60.

d Continued: Gage height —1.0, discharge 250; gage height —0.8, discharge 370; gage height —0.6, discharge 490; gage height —0.4, discharge 610; gage height —0.2, discharge 780.

Rating tables for stations in Colorado and Kansas.

[Numbers in box heads refer to pages in Water-Supply Papers Nos. 49 and 50.]

Gage height, in feet.	Discharge, in second-feet.											
	South Platte River near Platte Canyon, Colo. (280).	South Platte River at Denver, Colo. (281).	South Platte River at Orchard, Colo. (282).	Bear Creek near Morrison, Colo. (284).	Clear Creek at Forkscreek, Colo. (285).	Boulder Creek near Boulder, Colo. (287).	St. Vrain Creek near Lyons, Colo. (288).	Big Thompson Creek near Arkins, Colo. (290).	Republican River at Junction, Kans. (313).	Solomon River near Niles, Kans. (314).	Saline River near Salina, Kans. (315).	Smoky Hill River at Ellsworth, Kans. (316).
−0.2	*a* 109	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.0	133	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.2	160	.....	.....	.....	.....	.....	.....	4	.....	.....	.....	.....
.4	190	.....	.....	.....	.....	22	.....	19	.....	.....	.....	.....
.6	225	.....	.....	.....	.....	47	.....	60	.....	.....	.....	.....
.8	267	.....	.....	.....	.....	77	.....	116	.....	.....	.....	15
1.0	317	.....	105	9	.....	115	.....	177	.....	.....	.....	30
1.2	374	.....	121	11	.....	161	.....	239	.....	.....	.....	51
1.4	436	.....	139	15	32	220	.....	305	.....	.....	.....	77
1.6	505	.....	157	19	58	292	.....	378	.....	.....	.....	119
1.8	581	.....	175	23	93	367	7	461	.....	.....	.....	170
2.0	665	.....	196	27	133	444	23	556	.....	.....	.....	228
2.2	754	.....	224	31	179	522	64	671	.....	.....	.....	313
2.4	850	.....	260	36	235	603	113	813	.....	.....	.....	399
2.6	954	.....	340	42	299	688	166	990	130	.....	.....	485
2.8	1,066	.....	614	48	367	778	222	1,190	173	.....	.....	572
3.0	1,185	.....	984	55	441	870	282	1,390	225	.....	.....	660
3.2	1,305	.....	1,354	63	522	.....	345	1,590	300	.....	.....	.....
3.4	1,425	.....	1,724	71	614	.....	412	1,790	400	.....	.....	.....
3.6	1,545	.....	2,094	80	719	.....	483	1,990	500	.....	.....	.....
3.8	1,665	.....	2,464	91	832	.....	556	.....	610	.....	52	.....
4.0	1,785	.....	2,834	103	946	.....	629	.....	735	.....	60	.....
4.2	1,905	.....	3,204	116	1,060	.....	701	.....	890	.....	70	.....
4.4	2,025	.....	3,574	131	1,174	.....	774	.....	1,065	.....	82	.....
4.6	2,145	.....	3,944	148	1,288	.....	846	.....	1,275	70	96	.....
4.8	2,265	70	4,314	169	1,402	.....	918	.....	1,500	80	113	.....
5.0	2,385	113	4,684	197	.....	.....	.....	.....	1,730	100	133	.....
5.2	2,505	160	5,054	232	.....	.....	.....	.....	1,965	128	145	.....
5.4	2,625	213	5,424	271	.....	.....	.....	.....	2,205	159	158	.....
5.6	2,745	273	5,794	316	.....	.....	.....	.....	2,475	193	172	.....
5.8	.....	341	6,164	367	.....	.....	.....	.....	2,775	229	188	.....
6.0	.....	422	6,534	421	.....	.....	.....	.....	3,090	265	206	.....
6.2	.....	551	6,904	475	.....	.....	.....	.....	3,450	303	230	.....
6.4	.....	727	7,274	529	.....	.....	.....	.....	3,875	341	250	.....
6.6	.....	903	7,644	583	.....	.....	.....	.....	4,350	379	265	.....
6.8	.....	1,079	8,014	637	.....	.....	.....	.....	4,875	417	285	.....
7.0	.....	1,255	8,384	691	.....	.....	.....	.....	.....	455	305	.....
7.2	.....	1,493	8,754	.....	.....	.....	.....	.....	.....	493	325	.....
7.4	.....	1,755	9,124	.....	.....	.....	.....	.....	.....	531	350	.....
7.6	.....	2,077	9,494	.....	.....	.....	.....	.....	.....	570	370	.....
7.8	.....	2,399	9,864	.....	.....	.....	.....	.....	.....	610	395	.....
8.0	.....	2,723	10,234	.....	.....	.....	.....	.....	.....	650	418	.....
8.5	.....	3,533	11,159	.....	.....	.....	.....	.....	.....	755	482	.....
9.0	.....	4,348	.....	.....	.....	.....	.....	.....	.....	860	542	.....
9.5	.....	5,163	.....	.....	.....	.....	.....	.....	.....	967	615	.....
10.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,084	685	.....
11.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,327	835	.....
12.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,604	1,010	.....
13.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,900	1,200	.....
14.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,204	1,405	.....
15.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,528	1,630	.....
16.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,884	1,885	.....
17.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,267	2,165	.....
18.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,681	2,495	.....
19.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,851	.....

a Continued: Gage height −1.0, discharge 33; gage height −0.8, discharge 50; gage height −0.6, discharge 68; gage height −0.4, discharge 87.

Rating tables for stations in Kansas and Colorado.

[Numbers in box heads refer to pages in Water-Supply Paper No. 50.]

Gage height, in feet.	Discharge, in second-feet.										
	Blue River near Manhattan, Kans. (317).	Kansas River at Lecompton, Kans. (318).	Lake Creek at Interlaken station, Twin Lakes, Colo. (320).	Lake Creek below Twin Lakes, Colo. (320).	Arkansas River at Salida, Colo. (322).	Arkansas River near Canyon, Colo. (323).	Arkansas River at Pueblo, Colo. (325).	Arkansas River near Nepesta, Colo. (326).	Arkansas River at Hutchinson, Kans. (330).	Verdigris River near Liberty, Kans. (330).	Neosho River near Iola, Kans. (331).
0.0											
.2			36								
.4			90		106						
.6			155		191				14		
.8			238		284				33		
1.0			308		392				35		
1.2					516				55		
1.4				35	654		174		86		
1.6				55	803		263		134	10	
1.8				82	954		358		210	27	
2.0				125	1,106	194	458		315	55	125
2.2				174	1,260	242	566		424	90	165
2.4				228	1,416	297	680		552	140	220
2.6		3,350		294	1,578	362	799		720	205	292
2.8		3,613			1,746	438	926	154	954	280	385
3.0	150	3,880			1,914	542	1,060	191	1,224	368	510
3.2	200	4,150			2,085	712	1,204	235	1,512	464	650
3.4	270	4,420			2,257	916	1,357	285	1,855	560	810
3.6	340	4,690			2,429	1,135	1,527	346	2,280	660	1,015
3.8	420	4,960			2,601	1,357	1,730	427	2,795	760	1,255
4.0	500	5,230			2,773	1,579	1,973	610	3,385	860	1,520
4.2	590	5,550			2,945	1,801	2,288	974	4,040	960	1,800
4.4	680	5,940			3,117	2,023	2,633	1,337	4,755	1,060	2,100
4.6	770	6,370			3,289	2,245	3,003	1,701	5,600	1,164	2,450
4.8	860	6,840			3,461	2,467	3,373	2,064	6,590	1,280	2,800
5.0	960	7,360			3,633	2,689	3,743	2,428	7,740	1,400	3,150
5.2	1,060	7,960				2,911	4,113	2,791	8,990	1,520	3,500
5.4	1,160	8,570				3,133	4,483	3,155	10,400	1,650	3,850
5.6	1,270	9,200				3,355	4,853	3,518	12,100	1,780	4,200
5.8	1,380	9,850				3,577	5,223	3,882		1,920	4,550
6.0	1,500	10,520				3,799	5,593	4,246		2,060	4,900
6.5	1,825	12,220				4,354	6,518	5,155		2,410	5,775
7.0	2,175	13,920				4,909		6,064		2,760	6,650
7.5	2,560	15,635						6,973		3,115	7,525
8.0	2,970	17,350						7,782		3,480	8,400
8.5	3,400	19,065						8,691		3,850	9,275
9.0	3,850	20,780						9,600		4,225	10,150
9.5	4,315	22,495								4,600	11,025
10.0	4,800	24,210								5,000	11,950
10.5	5,325									5,400	12,950
11.0	5,870									5,801	13,950
12.0	7,000									6,619	15,950
13.0	8,240									7,458	17,960
14.0	9,860									8,300	20,010
15.0	12,030									9,150	22,060
16.0	14,280									10,100	24,120
17.0	16,530									11,150	26,220
18.0	18,780									12,300	28,370
19.0	21,030									13,500	
20.0	23,280									14,700	
22.0	27,780									17,150	
28.0										25,500	
30.0										28,300	
32.0										31,100	
34.0										33,950	
36.0										36,950	

Rating tables for stations in Colorado, Wyoming, and Utah.

[Numbers in box heads refer to pages in Water-Supply Paper No. 50.]

Gage height, in feet.	Discharge, in second-feet.										
	Rio Grande near Del Norte, Colo. (347).	Conejos River near Los Mogotes, Colo. (348).	Rio Grande at Cenicero, Colo. (348).	Black Fork of Green River near Granger, Wyo. (367).	Ashley Creek near Vernal, Utah (368).	Uinta River near Whiterocks, Utah (369).	Whiterocks River near Whiterocks, Utah (369).	Uinta River at Fort Duchesne, Utah (370).	Uinta River at Fort Duchesne, Utah (370).	Uinta River at Ouray School, Utah (371).	Duchesne River at Price road bridge, Utah (373).
−0.2				27				(*a*)	(*b*)	28	
.0				55						40	
.2				100						56	
.4				190	32					92	
.6				310	43					134	
.8			22	430	72	115	36			179	
1.0			43	550	112	155	61			221	
1.2	140		79	670	152	260	97			263	
1.4	258		142	810	200	370	135			309	
1.6	384		236	970	260	515	195			375	
1.8	518	251	414	1,130	322	695	286			463	
2.0	660	331	594	1,290	387	875	377		8	551	
2.2	812	419	774	1,450	452	1,055	468		25	639	
2.4	978	522	954	1,610	517	1,235	559	85	55	727	
2.6	1,149	638	1,134	1,770	582		650	128	90	815	
2.8	1,329		1,314	1,930	647		741	175	140	903	
3.0	1,522		1,494	2,090	712		832	265	230	991	
3.2	1,734		1,674		777		923	375	350	1,079	
3.4	1,968		1,854		842		1,014	485	475	1,167	
3.6	2,216		2,034		907		1,105	680	680	1,255	
3.8	2,478		2,214		972		1,196	940	940	1,343	
4.0	2,754		2,394					1,270		1,431	
4.2	3,054		2,574					1,660			
4.4	3,354		2,754					2,050			
4.6	3,654		2,934					2,440			
4.8	3,954		3,114					2,830			
5.0	4,254		3,294								255
5.2	4,554										300
5.4	4,854										370
5.6	5,154										480
5.8	5,454										600
6.0	5,754										740
6.2											900
6.4											1,070
6.6											1,280
6.8											1,520
7.0											1,770
7.2											2,050
7.4											2,370
7.6											2,730
7.8											3,090
8.0											3,450
8.2											3,810
8.4											4,170
8.6											4,530
8.8											4,890
9.0											5,250
9.2											5,610
9.4											5,970
9.6											6,330
9.8											6,690

a Applicable from September 1, 1899, to May 31, 1900.
b Applicable from June 1, 1900, to December 31, 1900.

Rating tables for stations in Colorado, Arizona, Nevada, and California.

[Numbers in box heads refer to pages in Water-Supply Papers Nos. 50 and 51.]

Gage height, in feet.	Discharge, in second-feet.											
	Grand River at Glenwood Springs, Colo. (375).	Gunnison River at Iola, Colo. (378).	Uncompahgre River at Montrose, Colo. (379).	Dolores River at Dolores, Colo. (380).	Los Pinos River at Ignacio, Colo. (382).	Animas River at Durango, Colo. (383).	Gila River at San Carlos, Ariz. (385).	Humboldt River near Elko, Nev. (395).	South Fork of Humboldt River at Mason's ranch, Nev. (396).	Humboldt River near Golconda, Nev. (397).	Humboldt River near Oreana, Nev. (398).	Truckee River at Tahoe, Cal. (402).
0.0												
.2										3	26	
.4									7	9	37	52
.6			10						24	16	52	72
.8			30						47	24	69	99
1.0			51				14		74	35	88	135
1.2			73				30		105	47	113	177
1.4			96				47		141	62	144	224
1.6			122				77		182	78	182	272
1.8			150				123	7	227	96	228	
2.0		250	183		25		170	22	276	114	284	
2.2		450	219		47		230	43	327	134	351	
2.4		652	257	20	78		320	70	382	156	430	
2.6		854	298	37	141		430	104	439	180		
2.8		1,056	344	82	244		580	144	499	206		
3.0	650	1,258		164	347		770	190	559	235		
3.2	755	1,460		280	450		1,100	240	619	266		
3.4	870	1,664		412	553		1,530	292	679	298		
3.6	1,005	1,871		555	656		2,120	346	740	332		
3.8	1,160	2,080		700	759		2,760	402	801	367		
4.0	1,350	2,295		847	862		3,400	461	862	404		
4.2	1,570	2,513		1,001	965		4,080	525	922	443		
4.4	1,810	2,735		1,160	1,068		4,760	594	983	485		
4.6	2,090	2,962		1,327	1,171		5,440	667	1,045	530		
4.8	2,430	3,191		1,506	1,274		6,120	743	1,106	578		
5.0	2,815	3,423		1,686	1,377		6,800	822	1,168	629		
5.2	3,245	3,658			1,480		7,520	903	1,230	684		
5.4	3,770	3,899					8,240	987	1,292	742		
5.6	4,420	4,142						1,073	1,354	803		
5.8	5,080	4,388						1,166	1,416	868		
6.0	5,740							1,257	1,478	937		
6.2	6,420					122		1,352		1,011		
6.4	7,100					168		1,449		1,093		
6.6	7,800					236		1,550		1,183		
6.8	8,520					310		1,655		1,281		
7.0	9,250					394		1,763		1,387		
7.2	10,000					490		1,873		1,501		
7.4	10,765					601		1,986		1,623		
7.6	11,540					736		2,101		1,753		
7.8	12,345					888		2,218		1,888		
8.0	13,155					1,044		2,339		2,026		
8.2	13,970					1,204				2,164		
8.4	14,800					1,370				2,302		
8.6	15,660					1,545						
8.8	16,520					1,733						
9.0	17,390					1,933						
9.2	18,300					2,138						
9.4	19,240					2,350						
9.6	20,180					2,579						
9.8	21,150					2,817						
10.0	22,140					3,066						
10.2	23,150					3,329						
10.4						3,606						
10.6						3,910						

Rating tables for stations in California, Nevada, Idaho, and Utah.

[Numbers in box heads refer to pages in Water-Supply Paper No. 51.]

Gage height, in feet.	Discharge, in second-feet.												
	Truckee River at Nevada-California State line (403).	Truckee River at Vista, Nev. (404).	Steamboat Creek at Steamboat Springs, Nev. (406).	Bear River at Battle-creek, Idaho (409).	Cub River at Franklin, Idaho (410).	Logan River near Logan, Utah (411).	Blacksmith Fork at Hyrum, Utah (412).	Bear River near Collinston, Utah (413).	Weber River near Uinta, Utah (414).	Provo River near Provo, Utah (416).	San Pitch River near Gunnison, Utah (425).	Sevier River near Gunnison, Utah (425).
0.0												
.2												
.4			4									5
.6			8					470				17
.8			14					580				33
1.0			20					690				49
1.2			29		34			815	135			
1.4			40	470	42			950	255			
1.6	205	16	50	580	51			1,105	375			
1.8	264	48	62	705	60			1,275	495		15	
2.0	328	105	75	835	68			1,450	615		37	
2.2	401	188		995	77			1,650	735		65	
2.4	486	283		1,165		110		1,850	855		95	
2.6	582	380		1,360		170		2,055	975			
2.8	683	479		1,560		245	112	2,280				
3.0	788	580		1,760		325	117	2,520				
3.2	897	683		1,960		412	147	2,760				
3.4	1,010	789		2,170		502	225	3,000				
3.6	1,131	898		2,380		603		3,250				
3.8	1,264	1,009		2,590		720		3,510				
4.0	1,409	1,123				857		3,770		140		
4.2	1,566	1,239				1,015		4,050		175		
4.4	1,725	1,357				1,185		4,350		225		
4.6	1,885	1,477						4,650		285		
4.8										355		
5.0										430		
5.2										530		
5.4										645		
5.6										788		
5.8										962		
6.0										1,136		
6.2										1,310		
6.4										1,484		
6.6										1,658		

Rating tables for stations in Idaho, Montana, Washington, and Oregon.

[Numbers in box heads refer to pages in Water-Supply Paper No. 51.]

Gage height, in feet.	Discharge, in second-feet.											
	Boise River near Boise, Idaho (427).	Weiser River near Weiser, Idaho (430).	Blackfoot River near Bonner, Mont. (430).	Missoula River at Missoula, Mont. (432).	Bitterroot River at Missoula, Mont. (435).	Spokane River at Spokane, Wash. (438).	Naches River at North Yakima, Wash. (440).	Yakima River at Union Gap, Wash. (441).	Yakima River at Kiona, Wash. (442).	Palouse River near Hooper, Wash. (443).	Umatilla River at Gibbon, Oreg. (444).	Dungeness River at Dungeness, Wash. (446).
0.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	56	.....
.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	.....
.2	.....	39	.....	.....	.....	.....	.....	.....	.....	.....	74	.....
.4	.....	71	581	.....	.....	.....	.....	.....	.....	.....	92	.....
.6	.....	105	743	.....	.....	.....	.....	.....	.....	.....	124	.....
.8	.....	150	905	.....	.....	.....	.....	.....	.....	.....	172	.....
1.0	867	215	1,067	.....	.....	1,341	.....	.....	.....	.....	233	.....
1.2	1,105	290	1,229	.....	910	1,611	.....	.....	.....	.....	298	.....
1.4	1,343	375	1,391	.....	1,010	1,897	.....	.....	.....	20	372	.....
1.6	1,581	470	1,553	.....	1,165	2,199	.....	.....	.....	26	454	.....
1.8	1,819	585	1,733	.....	1,350	2,517	.....	.....	.....	40	544	.....
2.0	2,057	720	1,930	.....	1,540	2,851	.....	.....	.....	61	642	.....
2.2	2,390	875	2,140	.....	1,730	3,201	.....	.....	.....	86	748	.....
2.4	2,780	1,050	2,390	.....	1,930	3,566	.....	.....	.....	115	862	.....
2.6	3,170	1,235	2,650	.....	2,160	3,946	.....	.....	.....	148	984	.....
2.8	3,560	1,425	2,910	.....	2,410	4,340	.....	.....	.....	185	1,114	.....
3.0	3,950	1,625	3,200	.....	2,680	4,749	.....	.....	.....	226	1,252	213
3.2	4,370	1,840	3,514	1,080	2,960	5,172	.....	.....	.....	271	1,398	225
3.4	4,820	2,075	3,828	1,300	3,260	5,609	.....	.....	.....	320	1,552	249
3.6	5,300	2,325	4,160	1,560	3,570	6,059	.....	.....	566	377	1,714	292
3.8	5,850	2,585	4,592	1,820	3,890	6,523	.....	.....	663	446	1,884	354
4.0	6,400	2,855	5,106	2,100	4,230	7,000	.....	650	780	525	2,061	430
4.2	7,000	3,125	5,620	2,430	4,660	7,489	.....	850	917	620	2,245	520
4.4	7,600	3,395	6,134	2,760	5,000	7,990	.....	1,050	1,074	735	2,435	616
4.6	8,320	3,665	6,648	3,100	5,440	8,503	.....	1,250	1,252	866	2,633	712
4.8	9,060	3,935	7,162	3,500	5,910	9,028	.....	1,450	1,468	998	2,839	808
5.0	9,800	4,205	7,676	3,900	6,400	9,565	350	1,700	1,705	1,130	3,052	904
5.2	10,540	4,475	8,190	4,400	6,930	10,114	390	1,950	1,962	1,262	3,272	1,000
5.4	11,280	4,745	8,704	4,900	7,500	10,673	470	2,250	2,240	1,394	3,498	1,096
5.6	12,020	5,015	9,218	5,400	8,100	11,243	590	2,600	2,534	1,526	3,730	1,192
5.8	12,760	5,285	9,732	6,000	8,700	11,824	750	3,000	2,842	1,658	3,970	1,288
6.0	13,500	5,555	10,246	6,600	9,300	12,416	910	3,500	3,160	1,790	4,217	1,384
6.2	14,240	5,825	.....	7,300	9,900	13,019	1,090	4,000	3,490	1,922	.....	1,480
6.4	14,980	6,095	.....	8,000	10,500	13,631	1,300	4,500	3,834	2,054	.....	1,576
6.6	15,720	6,365	.....	8,700	11,100	14,253	1,550	5,100	4,190	2,186	.....	1,672
6.8	16,460	6,635	.....	9,400	11,700	14,885	1,840	5,700	4,556	2,318	.....	1,768
7.0	17,200	.....	.....	10,200	12,300	15,525	2,170	6,300	4,935	2,450	.....	1,864
7.2	17,940	.....	.....	11,000	13,000	16,173	2,570	6,900	5,326	2,582	.....	1,960
7.4	18,680	.....	.....	11,800	13,700	16,829	3,010	7,600	5,730	2,714	.....	2,056
7.6	19,420	.....	.....	12,700	14,450	17,493	3,500	8,300	6,143	2,846	.....	2,152
7.8	.....	.....	.....	13,700	15,200	18,165	4,030	9,000	6,565	2,978	.....	2,248
8.0	.....	.....	.....	14,700	16,000	18,845	4,600	9,700	6,995	3,110	.....	2,344
8.2	.....	.....	.....	15,700	16,800	19,533	5,200	10,400	7,436	3,242	.....	2,440
8.4	.....	.....	.....	16,700	17,700	20,228	5,800	11,100	7,890	3,374	.....	2,536
8.6	.....	.....	.....	17,800	18,600	20,928	6,400	11,800	8,354	3,506	.....	2,632
8.8	.....	.....	.....	19,000	19,500	21,636	7,000	12,500	8,830	3,638	.....	2,728
9.0	.....	.....	.....	20,200	20,500	22,351	7,600	13,200	9,320	3,770	.....	2,824
9.2	.....	.....	.....	21,600	21,500	23,073	.....	13,900	9,823	3,902	.....	2,920
9.4	.....	.....	.....	23,200	22,500	23,800	.....	14,600	10,343	4,034	.....	3,016
9.6	.....	.....	.....	.....	23,600	24,531	.....	15,300	10,890	4,166	.....	3,112
9.8	.....	.....	.....	.....	24,700	25,269	.....	16,000	11,457	4,298	.....	3,208
10.0	.....	.....	.....	.....	25,900	26,012	.....	16,700	12,045	4,430	.....	3,304
10.2	.....	.....	.....	.....	27,200	26,759	.....	17,400	12,645	4,562	.....	3,400
10.4	.....	.....	.....	.....	28,600	27,510	.....	18,100	13,245	4,694	.....	3,496
10.6	.....	.....	.....	.....	30,100	28,265	.....	18,800	13,845	4,826	.....	3,592
10.8	.....	.....	.....	.....	31,700	29,024	.....	19,500	14,445	4,958	.....	3,688
11.0	.....	.....	.....	.....	33,500	29,787	.....	20,200	15,045	5,090	.....	3,784
11.2	.....	.....	.....	.....	35,250	30,554	.....	20,900	15,645	5,222	.....	.....
11.4	.....	.....	.....	.....	37,000	31,325	.....	21,600	16,245	5,354	.....	.....
11.6	.....	.....	.....	.....	38,750	32,099	.....	22,300	16,845	5,486	.....	.....
11.8	.....	.....	.....	.....	40,500	32,875	.....	23,000	17,445	5,618	.....	.....
12.0	.....	.....	.....	.....	42,250	33,653	.....	23,700	18,045	5,750	.....	.....
12.2	.....	.....	.....	.....	.....	.....	.....	.....	18,645	5,882	.....	.....
12.6	.....	.....	.....	.....	.....	.....	.....	.....	19,845	6,146	.....	.....
13.0	.....	.....	.....	.....	.....	.....	.....	.....	21,045	6,410	.....	.....
13.2	.....	.....	.....	.....	.....	.....	.....	.....	21,645	6,542	.....	.....
13.6	.....	.....	.....	.....	.....	.....	.....	.....	22,845	6,806	.....	.....
14.0	.....	.....	.....	.....	.....	.....	.....	.....	24,045	7,070	.....	.....
14.5	.....	.....	.....	.....	.....	.....	.....	.....	25,545	.....	.....	.....

Rating tables for stations in Washington and California.

[Numbers in box heads refer to pages in Water-Supply Paper No. 51.]

Gage height, in feet.	Discharge, in second-feet.										
	Elwha River at McDonald, Wash. (447).	Calowa River near Forks, Wash. (448).	Soleduck River near Quillayute, Wash. (449).	Sacramento River at Jollys Ferry, Cal. (450).	Salinas River near Salinas, Cal. (454).	Stanislaus River near Oakdale, Cal. (455).	Tuolumne River at Lagrange, Cal. (456).	San Joaquin River at Herndon, Cal. (458).	San Joaquin River at Herndon, Cal. (458).	King River near Red Mountain, Cal. (459).	Santa Ana River near Warmsprings, Cal. (475).
1.0	.....	a 330	192	.....	.....	.....	.....	(b)	(c)	.....	.....
1.2	.....	400	230	.....	.....	.....	.....	.....	.....	.....	.....
1.4	.....	485	270	.....	.....	.....	.....	.....	.....	.....	.....
1.6	510	575	310	.....	.....	.....	.....	.....	.....	.....	.....
1.8	550	665	360	.....	.....	.....	.....	.....	.....	.....	10
2.0	610	755	410	.....	.....	.....	.....	.....	.....	.....	14
2.2	690	850	470	.....	.....	.....	.....	60	160	.....	20
2.4	780	950	530	.....	.....	.....	.....	100	200	.....	27
2.6	900	1,050	590	.....	.....	.....	.....	170	300	.....	37
2.8	1,025	1,160	660	.....	.....	.....	.....	280	430	.....	52
3.0	1,175	1,270	730	.....	.....	.....	.....	445	630	.....	71
3.2	1,360	1,380	800	.....	.....	.....	2	640	870	.....	92
3.4	1,647	1,500	880	.....	.....	.....	7	850	1,110	.....	114
3.6	1,973	1,630	960	.....	6	.....	25	1,060	1,350	180	138
3.8	2,299	1,765	1,045	.....	10	.....	45	1,285	1,590	250	163
4.0	2,625	1,910	1,135	2,400	15	.....	85	1,520	1,830	320	190
4.2	2,951	2,070	1,225	2,670	25	30	140	1,765	2,070	400	219
4.4	3,277	2,250	1,325	2,970	40	70	250	2,030	2,310	480	250
4.6	3,603	2,430	1,425	3,290	65	150	410	2,315	2,550	572	.....
4.8	3,929	2,615	1,535	3,630	105	230	570	2,620	2,790	676	.....
5.0	4,255	2,805	1,650	3,980	173	310	750	2,940	3,030	780	.....
5.2	4,581	3,000	1,775	4,360	285	420	950	3,275	3,290	908	.....
5.4	4,907	3,200	1,905	4,760	455	540	1,180	3,620	3,620	1,036	.....
5.6	5,233	3,400	2,050	5,170	650	680	1,440	3,985	3,985	1,170	.....
5.8	5,559	3,600	2,215	5,590	850	820	1,740	4,370	4,370	1,310	.....
6.0	5,885	3,800	2,390	6,030	1,050	960	2,080	4,775	.....	1,450	.....
6.5	6,700	4,300	2,995	7,265	1,725	1,350	3,100	5,850	.....	1,930	.....
7.0	7,515	4,800	3,670	8,635	2,500	1,850	4,320	7,090	.....	2,450	.....
7.5	9,330	5,300	4,345	10,100	3,500	2,410	5,800	8,410	.....	3,120	.....
8.0	9,145	5,800	5,020	11,600	4,750	3,000	7,400	9,730	.....	3,920	.....
8.5	9,960	6,300	5,695	13,100	6,350	3,625	9,000	11,060	.....	4,870	.....
9.0	10,775	6,800	6,370	14,600	8,350	4,250	10,600	12,400	.....	6,000	.....
9.5	11,590	7,300	7,045	16,100	11,000	4,887	12,200	13,750	.....	7,300	.....
10.0	12,405	7,800	7,720	17,600	.....	5,525	13,800	15,110	.....	8,800	.....
11.0	14,035	8,800	9,070	20,800	.....	6,800	17,000	17,870	.....	11,800	.....
12.0	.....	9,800	10,420	24,400	.....	8,075	20,200	20,780	.....	14,800	.....
13.0	.....	10,800	11,770	28,400	.....	9,350	.....	.....	.....	17,800	.....
14.0	.....	.....	.....	32,400	.....	10,625	.....	.....	.....	20,800	.....
15.0	.....	.....	.....	36,800	.....	11,900	.....	.....	.....	.....	.....
16.0	.....	.....	.....	41,600	.....	13,175	.....	.....	.....	.....	.....
17.0	.....	.....	.....	46,600	.....	.....	.....	.....	.....	.....	.....
18.0	.....	.....	.....	52,300	.....	.....	.....	.....	.....	.....	.....
19.0	.....	.....	.....	58,200	.....	.....	.....	.....	.....	.....	.....
20.0	.....	.....	.....	64,200	.....	.....	.....	.....	.....	.....	.....
22.0	.....	.....	.....	76,800	.....	.....	.....	.....	.....	.....	.....
24.0	.....	.....	.....	90,000	.....	.....	.....	.....	.....	.....	.....
26.0	.....	.....	.....	103,200	.....	.....	.....	.....	.....	.....	.....
28.0	.....	.....	.....	116,400	.....	.....	.....	.....	.....	.....	.....
30.0	.....	.....	.....	129,600	.....	.....	.....	.....	.....	.....	.....
32.0	.....	.....	.....	142,800	.....	.....	.....	.....	.....	.....	.....
34.0	.....	.....	.....	156,000	.....	.....	.....	.....	.....	.....	.....
35.0	.....	.....	.....	162,600	.....	.....	.....	.....	.....	.....	.....

a Continued: Gage height −0.4, discharge 70; gage height −0.3, discharge 80; gage height −0.1, discharge 100; gage height 0.0, discharge 110; gage height 0.2, discharge 144; gage height 0.4, discharge 180; gage height 0.6, discharge 225; gage height 0.8, discharge 275.

b Applicable from January 1, 1900, to June 30, 1900; also from November 23, 1900, to December 31, 1900.

c Applicable from July 1, 1900, to November 22, 1900.

DRAINAGE AREAS.

The following table gives the areas of the drainage basins of rivers mentioned in this and other reports of the Division of Hydrography. A similar table was printed in Water-Supply Paper No. 11, pages 95 to 100. Most of the areas have been obtained by planimeter measurement of the best maps available, the topographic atlas sheets of the United States Geological Survey being used for such drainage basins as have been mapped.

Drainage areas of streams in the United States.

	Square miles.
Alabama River at Montgomery, Alabama	13,500
Alabama River at Selma, Alabama	15,400
Allegheny River at Warren, Pennsylvania	3,057
Allegheny River at Oil City, Pennsylvania	4,526
Allegheny River at Parkers Landing, Pennsylvania	6,019
Allegheny River at Mahoning, Pennsylvania	6,964
Allegheny River at Freeport, Pennsylvania	9,219
Allegheny River at Pittsburg, Pennsylvania	16,992
Allegheny River at mouth, Pennsylvania	11,400
Allens Creek (tributary of Genesee River) at mouth, New York	198
American Fork near American Fork, Utah	66
Androscoggin River below junction of Umbagog Outlet and Magalloway River, Maine	1,180
Androscoggin River at Berlin Falls, Maine	1,480
Androscoggin River at Rumford Falls, Maine	2,320
Androscoggin River at Livermore Falls, Maine	2,690
Androscoggin River at Lewiston, Maine	3,120
Androscoggin River at Brunswick, Maine	3,700
Angelica Creek (tributary of Genesee River) at mouth, New York	82
Animas River at Durango, Colorado	812
Antietam Creek at Sharpsburg, Maryland	293
Arkansas River, East Fork, near Leadville, Colorado	44
Arkansas River, Lake Fork, near Leadville, Colorado	21
Arkansas River, Tennessee Fork, near Leadville, Colorado	44
Arkansas River at Granite, Colorado	425
Arkansas River at Salida, Colorado, above South Fork	1,160
Arkansas River at Canyon, Colorado	3,060
Arkansas River at Swallows, Colorado	4,300
Arkansas River at Rock Canyon, Colorado	4,560
Arkansas River at Pueblo, Colorado	4,600
Arkansas River at Nepesta, Colorado	9,130
Arkansas River at Rockyford, Colorado	11,440
Arkansas River at La Junta, Colorado, including Fountain Creek drainage (1,011)	12,200
Arkansas River at Lamar, Colorado	19,367
Arkansas River at Granada, Colorado	23,478
Arkansas River at railroad bridge above Holly, Colorado, including Animas River drainage (3,337)	23,500
Arkansas River at Colorado-Kansas State line	24,600
Arkansas River at Hutchinson, Kansas	34,000
Arkansas River in Colorado	30,720
Arkansas River in Kansas	7,040
	37,760

	Square miles.
Ashley Creek (tributary of Green River) at the canyon, Utah	250
Avery Creek (tributary of French Broad River) at bridge on road from Mills River to Asheville, North Carolina	8
Bald Creek (tributary of Nolichucky River) at mouth, North Carolina	15
Bald Mountain Creek 1 mile above mouth, North Carolina	16
Basin Creek (tributary of Caliente Creek), California	96
Battenkill River at mouth, New York	438
Battle Creek at Battlecreek, Michigan	180
Battle Creek at mouth, Michigan	244
Bear Creek at Morrison, Colorado	170
Bear Creek (tributary of Nolichucky River) at Flat Rock, North Carolina	10
Bear Creek (tributary of Holston River) at mouth, Virginia	17
Bear River at Soda Springs, Idaho	3,940
Bear River at Battlecreek, Idaho	4,500
Bear River at Collinston, Utah	6,000
Beards Creek (tributary of Genesee River) at mouth, New York	41
Beaver Creek (tributary of New River) at mouth, North Carolina	16
Beaver Creek (tributary of Nolichucky River) at mouth, near Sprucepine, North Carolina	6
Beaver Dam Creek (tributary of French Broad River) 50 yards above mouth, North Carolina	14
Beaver Dam Creek (tributary of Watauga River) at Leander, North Carolina	21
Beaver Dam Creek (tributary of Holston River) at Damascus, Virginia	57
Beaverkill Creek (tributary of Delaware River) at mouth, New York	322
Beaver River above Beaver, New York	153
Beaver River below Beaver, New York	169
Beaver River at mouth, New York	322
Beech Creek (tributary of Watauga River) above mouth of Fogey Creek, North Carolina	16
Big Bugaboo Creek (tributary of Yadkin River) at ford on road from Roaring River to Elkin, North Carolina	17
Big Elkin Creek (tributary of Yadkin River) at railroad trestle at Elkin, North Carolina	35
Big Goose Creek at Sheridan, Wyoming, below mouth of Little Goose Creek	330
Bighorn River at Thermopolis, Wyoming	8,184
Big Ivy Creek (tributary of French Broad River) one-eighth mile below mouth of Bull Creek, North Carolina	158
Big Laurel Creek (tributary of New River) at mouth, North Carolina	29
Big Pine Creek (tributary of French Broad River) above mouth, North Carolina	16
Big Rock Creek (tributary of Nolichucky River) at ford on Huntdale-Bakersville road, North Carolina	60
Big Sandy Creek at Dadeville, Alabama	195
Big Thompson Creek at Arkins, Colorado	305
Bitterroot River at Missoula, Montana	3,260
Black Creek, Upper (tributary of Genesee River), at mouth, New York	39
Black Creek, Lower (tributary of Genesee River), at mouth, New York	212
Black River at Forestport, New York	268
Black River at Lyons Falls, below Moore River, New York	810
Black River at Carthage, New York	1,741
Black River at Watertown, New York, gaging station	1,889
Black River at mouth, New York	1,930

	Square miles.
Blackfoot River foot marshes in sec. 12, T. 5 S., R. 40 E., Idaho	666
Blackfoot River at Bonner, Montana	2,465
Black Fork of Green River 3 miles west of Granger, Wyoming	1,747
Black Fork of Green River at Granger, Wyoming, including Hams Fork	2,400
Blacksmith Fork at Hyrum, Utah	286
Black Warrior River at Tuscaloosa, Alabama	4,900
Blue River at Manhattan, Kansas	9,490
Blue River in Kansas	2,450
Blue River in Nebraska	7,040
	9,490
Boardman River at Traverse, Michigan	295
Boise River at Boise, Idaho	2,450
Boise River at Caldwell, Idaho	3,360
Boone Fork of Watauga River at Shull's mill, North Carolina	9
Boulder Creek at Boulder, Colorado	179
Bowlen Creek (tributary of Nolichucky River) near Burnsville, North Carolina	6
Boylston Creek (tributary of French Broad River) at bridge near mouth, North Carolina	17
Broad River, South Fork, at mouth, Georgia	215
Broad River, North Fork, at Carlton, Georgia	762
Broad River at bridge above mouth of Buffalo Creek, North Carolina	72
Broad River at Gaffney, South Carolina	1,435
Broad River at Alston, South Carolina	4,609
Brown Creek (tributary of Nolichucky River) at ford on Marion-Micaville road, North Carolina	2
Bruneau River at Grandview, Idaho	1,800
Brush Creek (tributary of Watauga River) near Carter, Tennessee	15
Buck Creek (tributary of Catawba River) near mouth, North Carolina	33
Buffalo Creek (tributary of Broad River) at main ford, North Carolina	11
Buffalo Creek (tributary of New River) one-eighth mile above mouth, North Carolina	24
Buffalo Creek (tributary of Watauga River) at mouth, Tennessee	39
Butternut Creek (tributary of Susquehanna River) at mouth, New York	123
Byars Creek (tributary of Holston River) at mouth, Virginia	8
Cache la Poudre River at Fort Collins, Colorado	1,060
Caliente Creek, California:	
Tehachapi Creek	108
Caliente Creek proper	219
Basin Creek	96
	423
Calowa River at Forks, Washington	213
Canadaway Creek, West Branch, above Fredonia, New York	4
Canadian River in Kansas	5,110
Canadian River in New Mexico	16,900
Canadian River in Texas	18,620
	40,630
Canandaigua Outlet at inlet, head of Canandaigua Lake, New York	85
Canandaigua Outlet at foot of Canandaigua Lake, New York	175
Canandaigua Outlet at Phelps, New York	390
Canandaigua Outlet at junction with Mud Creek, New York	431
Canaseraga Creek (tributary of Genesee River) at mouth, New York	259
Cancomgomoc River at entrance into Chesuncook Lake, Maine	230
Caneadea Creek (tributary of Genesee River) at mouth, New York	63

	Square miles.
Cane Creek (tributary of Nolichucky River) one-half mile above mouth, North Carolina	30
Cane Creek (tributary of Catawba River) near mouth, North Carolina	16
Caney Creek (tributary of French Broad River) at bridge near Westfall's place, North Carolina	88
Caney River (tributary of Nolichucky River) near Big Tom Wilson's, North Carolina	21
Caney River (tributary of Nolichucky River) 1½ miles above mouth, North Carolina	148
Caney River (tributary of Nolichucky River) at mouth near Huntdale, North Carolina	158
Canisteo River (tributary of Chemung River) at mouth, New York	780
Cape Fear River at Fayetteville, North Carolina	4,493
Carson River near Empire, Nevada	894
Carson River, East Fork, at Rodenbahs, Nevada	414
Carson River, West Fork, at Woodfords, California	70
Catawba River, North Fork, near mouth, North Carolina	84
Catawba River near Oldfort, North Carolina	12
Catawba River at Morganton, North Carolina	758
Catawba River at Lookout Shoals, North Carolina	1,424
Catawba River at Catawba, North Carolina	1,514
Catawba River at Fort Mill, South Carolina	2,987
Catherines Creek (tributary of Seneca River) at mouth, New York	94
Cathey Creek (tributary of French Broad River) at ford of Brevard–Jeptha road, North Carolina	11
Cattail Branch (tributary of Nolichucky River) near Burnsville, North Carolina	7
Cayadutta Creek below Johnstown, New York, gaging station	40
Cayadutta Creek at mouth, New York	62
Cayuga Inlet (tributary of Cayuga Lake, New York), including Cascadilla Creek	173
Cayuga Lake at outlet, New York	1,593
Cayuta Creek (tributary of Susquehanna River) at mouth, New York	148
Cazenovia Lake at outlet, New York	9
Cedar Creek (tributary of Holston River) at mouth, Virginia	6
Chama River at Abiquiu, New Mexico	2,300
Champlain Lake in New York — 2,950	
Champlain Lake in Vermont — 4,270	
Champlain Lake in Quebec — 740	
Champlain Lake, area of water surface — 400	
	8,360
Chattahoochee River at Oakdale, Georgia	1,560
Chattahoochee River at West Point, Georgia	3,300
Charlotte River (tributary of Susquehanna River) at mouth, New York	178
Chautauqua Outlet at Chautauqua Lake, New York	178
Chautauqua Outlet below Cassadaga Creek, New York	343
Cheat River at Uneva, West Virginia	1,375
Cheat River at Rowlesburg, West Virginia	886
Chemung River at junction of Canisteo and Cohocton rivers, New York	1,941
Chemung River at Elmira, New York	2,055
Chemung River at mouth, New York	2,518
Chenango River (tributary of Susquehanna River) above Canasawacta Creek, New York	297

	Square miles.
Chenango River (tributary of Susquehanna River) above Tioughnioga, New York	685
Chenango River (tributary of Susquehanna River) at mouth, New York	1,540
Chenevas Creek (tributary of Susquehanna River) at mouth, New York	127
Chenunda Creek (tributary of Genesee River) at mouth, New York	30
Cherry Valley Creek (tributary of Susquehanna River) at mouth, New York	121
Cheyenne River in Montana	3,750
Cheyenne River in Nebraska	17,910
Cheyenne River in North Dakota	39,770
Cheyenne River in South Dakota	40,840
Cheyenne River in Wyoming	12,030
	114,300
Chittenango Creek at Bridgeport, New York, gaging station, including Cazenovia Lake	307
Chittenango Creek at mouth, New York	309
Chowchilla Creek above sec. 1, T. 9 S., R. 18 E., California	268
Cimarron River at Arkalon, Kansas	5,200
Clam Lakes at outlet, Michigan (water surface 6.7 square miles)	67
Clam River at mouth, Michigan	307
Clarion River (tributary of Allegheny River) at Clarion, Pennsylvania	865
Clear Creek 4 miles west of Buffalo, Wyoming	118
Clear Creek at Forkscreek, Colorado, gaging station	345
Clear Creek near Granite, Colorado	72
Clear Creek (tributary of Catawba River) near mouth, North Carolina	3
Clyde River at Lyons, New York, junction of Canandaigua Outlet and Mud Creek	729
Clyde River at Clyde, New York	807
Clyde River at mouth, New York	869
Cobbosseecontee River near Augusta, Maine	230
Cohocton River (tributary of Chemung River) at mouth, New York	425
Cohocton River (tributary of Susquehanna River) at mouth, New York	425
Colbert Creek (tributary of Nolichucky River) at ford on Micaville-Marion road, North Carolina	2
Cold Creek (tributary of Genesee River) at mouth, New York	41
Colorado River at Austin, Texas	37,000
Colorado River in Arizona[1]	56,182
Colorado River in California[1]	8,610
Colorado River in Colorado[1]	5,490
Colorado River in Nevada[1]	3,200
Colorado River in New Mexico[1]	19,000
Colorado River in Utah[1]	21,633
	114,115
Colorado River at Yuma, Arizona	225,049
Columbia River in Idaho	7,880
Columbia River in Oregon	24,093
Columbia River in Montana	25,000
Columbia River in Washington	26,160
	81,133
Conasauga River at mouth, New York	723
Conejos River at Los Mogotes, Colorado	282
Conejos River at Conejos, Colorado	333

[1] Not including Grand, Green, nor Gila basins.

	Square miles.
Conesus Lake (tributary of Genesee River) at mouth, New York	89
Connecticut River at Holyoke, Massachusetts	8,660
Connecticut River at Hartford, Connecticut	10,234
Conemaugh River (tributary of Allegheny River) at Saltsburg, Pennsylvania	1,403
Conemaugh River (tributary of Allegheny River) at Johnstown, Pennsylvania	711
Coosa River at Rome, Georgia	4,006
Coosa River at Lock No. 4, Alabama	7,053
Coosa River at Riverside, Alabama	7,065
Coosa River at Lock No. 5, Alabama	7,648
Coosawattee River at Carters, Georgia	531
Coosawattee River at mouth, Georgia	885
Coquago Creek (tributary of Delaware River) at mouth, New York	82
Coshaqua Creek (tributary of Genesee River) at mouth, New York	82
Cottonwood Creek, South Fork, near Buena Vista, Colorado	28
Cottonwood Creek, Middle Fork, near Buena Vista, Colorado	37
Cove Creek (tributary of Green River) near mouth, North Carolina	7
Cove Creek (tributary of Watauga River) at mouth, North Carolina	39
Cove Creek (tributary of Broad River) at bridge on Rutherfordton road, North Carolina	78
Crabtree Creek (tributary of Nolichucky River) at ford on Burnsville–Sprucepine road, North Carolina	20
Crawford Creek (tributary of Genesee River) at mouth, New York	12
Crib Creek (tributary of Catawba River) near mouth, North Carolina	10
Croton River at old Croton Dam, New York	338
Croton River at new Croton Dam, New York	360
Cryder Creek (tributary of Genesee River) at mouth, New York	43
Cub River at Franklin, Idaho	53
Curtis Creek (tributary of Catawba River) near mouth, North Carolina	11
Dan River at South Boston, Virginia	2,770
Dan River at Clarksville, Virginia	3,798
Davidson River (tributary of French Broad River) at county bridge near mouth, North Carolina	48
Dead River at mouth, Maine	1,000
Deep River at Cumnock, North Carolina	1,110
Deep River at Moncure, North Carolina	1,400
Deer River (tributary of Black River) at mouth, New York	107
Delaware River, West Branch, at Deposit, below Coquago (Oquago) Creek, New York	519
Delaware River, West Branch, at mouth, New York	685
Delaware River above the mouth of Beaver Kill, New York	520
Delaware River below junction of East and West branches, New York	1,604
Delaware River below Port Jervis, New York	3,252
Delaware River below mouth of Neversink River, New York	3,600
Delaware River at Pennsylvania State line	2,580
Delaware River at Delaware Water Gap, Pennsylvania	4,176
Delaware River at Lambertville, New Jersey	6,855
Delaware River at mouth, Wilmington, Delaware	11,895
Denton Valley Creek (tributary of Holston River) at mouth, Virginia	12
Deschutes River at Moro, Oregon	9,900
Desplaines River at Riverside, Illinois	633
Doe Creek (tributary of Watauga River) one-half mile above mouth, Tennessee	43

	Square miles.
Doe River (tributary of Watauga River) 1 mile above Elizabethton, Tennessee	140
Doe River (tributary of Watauga River) at Allentown, Tennessee	72
Dolores River, West Fork, Colorado	160
Dolores River at Dolores, Colorado, gaging station	524
Dolores River at Dolores, Colorado, including Lost Canyon Creek (59)	583
Dolores River at intake of ditch system, Colorado	586
Dowagiac River (tributary of St. Joseph River) at mouth, Michigan	281
Dry Gulch Creek (tributary of Duchesne River) at mouth, Utah	260
Duchesne River above Strawberry Creek, Utah	703
Duchesne River at Lake Fork, Utah	2,247
Duchesne River at Price road bridge, Utah	2,746
Duchesne River at mouth, Utah	3,985
Dungeness River at Sequim, Washington, gaging station	145
Dutch Creek (tributary of Watauga River) at Valle Cruces, North Carolina	11
Dykes Creek at mouth, New York	68
East branch or fork of any river, *see* the river.	
East Canada Creek at Dolgeville, New York	256
East Canada Creek at mouth, New York	283
Eaton Brook (tributary of Chenango River) at mouth, New York	11
Elk Creek (tributary of New River) at Elk crossroads, North Carolina	10
Elk Creek (tributary of New River) 200 yards above mouth, Virginia	82
Elk Creek, North Fork, at Banners Elk, North Carolina	4
Elk Creek, South Fork, at Banners Elk, North Carolina	7
Elk Creek (tributary of Watauga River) at Lineback, Tennessee	80
Elk Creek (tributary of Yadkin River) one-fourth mile above ford, North Carolina	52
Elk Fork Creek (tributary of Nolichucky River) near Big Tom Wilson's, North Carolina	3
Elkhart River at mouth, Indiana	500
Elkhorn River at Norfolk, Nebraska	2,474
Elkhorn River at Arlington, Nebraska	5,980
Elwha River at McDonald, Washington	188
Etowah River at Canton, Georgia	604
Etowah River at mouth, Rome, Georgia	1,854
Fall Creek, New York (tributary of Cayuga Lake), not including Cascadilla Creek	152
Fall River 5 miles above mouth, Idaho	594
Farm Creek (tributary of Duchesne River) at canyon, Utah	47
Fifteenmile Creek (tributary of Holston River) at mouth, Virginia	13
Fish Creek, East Branch, above Point Rock, New York	104
Fish Creek, West Branch, at McConnellsville, New York	187
Fish Creek (tributary of Oneida River) at junction with Hudson River, New York	253
Fish Creek (tributary of Oneida River) at mouth, New York	480
Fisher River (tributary of Yadkin River) at railroad trestle, North Carolina	135
Flannery Fork (tributary of New River) at ford on Boone River–Blowing Rock road, North Carolina	6
Flat Creek (tributary of Swannanoa River) 2 miles below Black Mountain Station, North Carolina	18
Flat Creek (tributary of French Broad River) at mouth, North Carolina	25
Flat River (tributary of Grand River) at mouth, Michigan	602

	Square miles.
Flint River at Molena, Georgia	892
Flint River at Woodbury, Georgia	988
Flint River at Albany, Georgia	5,000
Florida River at Stewart's ranch, 9 miles from Durango, Colorado	136
Fogey Creek (tributary of Watauga River) at mouth, North Carolina	3
Forge Creek (tributary of Watauga River) near mouth, Tennessee	18
Fort Tejon Creek, California, including Cuddy Creek and Castac Lake (upper basin, 56)	93
Fox Creek (tributary of New River) one-fourth mile above mouth, Virginia	60
French Broad River, North Fork, above mouth of West Fork, North Carolina	36
French Broad River at crossing of Brevard–Webster road, North Carolina	26
French Broad River at ford on road between Tucker and Shoal creeks, North Carolina	19
French Broad River, East Fork, near mouth, North Carolina	26
French Broad River, Middle Fork, at bridge above ford, North Carolina	5
French Broad River, West Fork, at bridge near mouth, North Carolina	30
French Broad River at Eastatoe Bridge, North Carolina	67
French Broad River at bridge near Carson Creek, North Carolina	133
French Broad River at Penrose, North Carolina	294
French Broad River at Fanning Bridge, North Carolina	644
French Broad River at Asheville, North Carolina	987
French Broad River at Oldtown, Tennessee	1,737
French Broad River at mouth, Tennessee	5,133
Frenchman River at Wauneta, Nebraska	989
Frenchman River at Palisade, Nebraska	1,032
Fulton Chain above Old Forge, New York	41
Gallatin River at Logan, Montana	1,620
Gap Creek (tributary of New River) at mouth, North Carolina	11
Gap Creek (tributary of Watauga River) at mouth, Tennessee	10
Garoga Creek 3 miles above Mohawk River, New York	81
Genesee River below Cryder Creek, New York	143
Genesee River below Chenunda Creek, New York	211
Genesee River below Dykes Creek, New York	282
Genesee River below Vandemarck Creek, New York	323
Genesee River below Knights Creek, New York	346
Genesee River below Phillips Creek, New York	405
Genesee River below Van Campens Creek, New York	466
Genesee River below Angelica Creek, New York	563
Genesee River below White Creek, New York	585
Genesee River below Upper Black Creek, New York	627
Genesee River below Crawford Creek, New York	649
Genesee River below Caneadea Creek, New York	714
Genesee River below Cold Creek, New York	786
Genesee River below Rush Creek, New York	822
Genesee River below Wiscoy Creek, New York	942
Genesee River below Wolf Creek, New York	994
Genesee River below Silver Lake Creek, New York	1,060
Genesee River at Mount Morris, New York	1,070
Genesee River below Coshaqua Creek, New York	1,142
Genesee River below Canaseraga Creek, New York	1,407
Genesee River below Beards Creek, New York	1,464
Genesee River below Conesus Lake, New York	1,644

	Square miles.
Genesee River below Honeoye Creek, New York	1,939
Genesee River below Allens Creek, New York	2,145
Genesee River at Rochester, New York	2,365
Genesee River at mouth, New York	2,446
Genesee River below Black Creek, New York	2,380
Gila River at San Carlos, Arizona	13,455
Gila River at Buttes, Arizona	17,834
Gila River in Arizona, including small lost basins	56,838
Gila River in New Mexico, including small lost basins	14,300
	71,138
Goose Creek at Lake Cheesman, Colorado, gaging station	86
Grand River at Glenwood Springs, Colorado	5,838
Grand River at Grand Junction, Colorado, above Gunnison River	8,644
Grand River at Grand Junction, Colorado, below Gunnison River, including Uncompahgre (497) and Gunnison at mouth (7,935)	16,579
Grand River in Colorado	22,294
Grand River in Utah	3,873
	26,167
Grand River above Lansing, Michigan	756
Grand River at North Lansing dam, Michigan	1,168
Grand River below mouth of Red Cedar River, Michigan	1,229
Grand River at North Lansing, Michigan	1,238
Grand River above Portland, Michigan	1,404
Grand River below mouth of Lookingglass River, Michigan	1,710
Grand River above Lyons, Michigan	1,748
Grand River below mouth of Maple River, Michigan	2,667
Grand River at Ionia, Michigan	2,818
Grand River above Lovell, Michigan	2,971
Grand River below mouth of Flat River, Michigan	3,573
Grand River above Grand Rapids, Michigan	4,883
Grand River at C. and W. M. R. R. bridge, Grand Rapids, Michigan	4,900
Grand River at Brick House, Michigan, gaging station	4,961
Grand River at Lamont, Michigan	5,179
Grand River above mouth, Michigan	5,572
Grand Encampment Creek at Peryam's ranch, near Encampment, Wyoming	252
Grassy Creek (tributary of Nolichucky River) near Sprucepine, North Carolina	12
Great Basin in California	47,240
Great Basin in Idaho	3,420
Great Basin in Nevada	102,220
Great Basin in Oregon	18,950
Great Basin in Utah	43,548
Great Basin in Wyoming	1,494
	216,872
Great Lakes:	
Superior	80,400
Michigan	68,100
Huron	75,300
St. Clair	6,815
Erie	34,480
Ontario	32,980
	298,075
Great Salt Lake, Utah	2,280
Green River (tributary of Broad River) at Cox's bridge, North Carolina	200

	Square miles.
Green River (tributary of Broad River) near Saluda, North Carolina	51
Green River at Greenriver, Wyoming	7,450
Green River at Blake, Utah	38,200
Green River in Colorado 10,332	
Green River in Utah 15,916	
Green River in Wyoming 20,977	
	47,225
Green River, Black Fork, at Granger, Wyoming	2,400
Greenbrier River at Alderson, West Virginia	1,344
Greenbrier River at mouth, West Virginia	1,575
Grey Bull River at Meteetse, Wyoming	870
Grose Creek (tributary of Holston River) at mouth, Virginia	3
Gunnison River at Iola, Colorado	2,298
Gunnison River at Grand Junction, Colorado	7,935
Gunpowder River at Baltimore conduit, Maryland	294
Halls Creek (tributary of Holston River) at mouth, Virginia	14
Haw River at Moncure, North Carolina	1,800
Hemlock Lake (tributary of Genesee River) at outlet, New York	43
Henry Fork 1 mile above mouth of Fall River, Idaho	931
Henson Creek (tributary of Nolichucky River) at mouth, North Carolina	7
Hickorynut Creek (tributary of Broad River) at mouth, North Carolina	8
Higgins Lake, Michigan (water surface 15 square miles)	67
Hillabee Creek at Alexander City, Alabama	214
Hiwassee River at Murphy, North Carolina	410
Hiwassee River at Reliance, Tennessee	1,180
Hiwassee River at Charleston, Tennessee	2,297
Hiwassee River at mouth, Tennessee	2,698
Hogthief Creek (tributary of Holston River) at mouth, Virginia	6
Hogtrough Creek (tributary of Holston River) at mouth, Virginia	6
Hollow Poplar Creek (tributary of Nolichucky River) at ford on Erwin–Bakersville road, North Carolina	9
Holston River, South Fork, below mouth of Middle Fork, Virginia	582
Holston River, South Fork, at Bluff City, Tennessee	828
Holston River, South Fork, below mouth of Laurel Fork, Virginia	336
Holston River, South Fork, above mouth of Laurel Fork, Virginia	160
Holston River, South Fork, at Rye Valley, Virginia	37
Holston River, Middle Fork, 5 miles above mouth at Shallow Ford, Virginia	227
Holston River, Middle Fork, above mouth of Bear Creek, Virginia, near Marion, Virginia	33
Holston River at mouth, Tennessee	3,790
Hominy Creek (tributary of French Broad River) at Asheville, North Carolina	104
Honeoye Creek (tributary of Genesee River) at mouth, New York	263
Hood River at Tucker, Oregon	350
Hood River at mouth, Oregon	418
Hoosic River (tributary of Hudson River) at mouth, New York	730
Horse Creek (tributary of New River) one-fourth mile above mouth, North Carolina	56
Horse Creek (tributary of Nolichucky River) at mouth, North Carolina	6
Houghton Lake, Michigan (water surface 31 square miles)	185
Hubbard Lake, Michigan (water surface 134 square miles)	148
Hudson River at Glens Falls, New York	2,800
Hudson River at Mechanicsville, New York	4,500

	Square miles.
Hudson River at Troy, New York	8,000
Hudson River at Hadley, New York	1,092
Humboldt River at Elko, Nevada	2,840
Humboldt River at Battle Mountain, Nevada	7,800
Humboldt River at Golconda, Nevada	10,780
Humboldt River at Oreana, Nevada	13,800
Humboldt River at Oreana, Nevada, including Grassy Valley	14,967
Humboldt River, North Fork, at Peko, Nevada	1,020
Humboldt River, South Fork, at Mason's ranch, Nevada	1,150
Hungry Mother Creek (tributary of Holston River) at ford near Marion, Virginia	16
Huron River at mouth, Michigan	950
Huttons Branch (tributary of Holston River) at mouth, Virginia	14
Independence Creek (tributary of Black River) at mouth, New York	90
Indian Lake at gaging station, New York	146
Jack Creek (tributary of Nolichucky River) at mouth, North Carolina	22
James River at Buchanan, Virginia	2,058
James River at Balcony Falls, Virginia	3,027
James River at Cartersville, Virginia	6,232
Jarrett Creek (tributary of Catawba River) near mouth, North Carolina	6
Jefferson River at Sappington, Montana	8,984
Jefferson River at Threeforks, Montana	9,400
Jim Scott Branch (tributary of Holston River) at mouth, Virginia	2
Johns River (tributary of Catawba River) on highway bridge near Morganton, North Carolina	213
Johns River (tributary of Catawba River) at Collettsville, North Carolina	70
Jones Falls at Baltimore conduit, Maryland	38
Juniata River at Newport, Pennsylvania	3,476
Juniata River at mouth, Pennsylvania	3,530
Kalamazoo River, North Branch, at Albion, Michigan	138
Kalamazoo River, South Branch, at Albion, Michigan	136
Kalamazoo River at Marengo dam, Michigan	261
Kalamazoo River below junction of North and South branches	274
Kalamazoo River at Marshall, Michigan	443
Kalamazoo River above Battlecreek, Michigan	603
Kalamazoo River below Battlecreek, Michigan	847
Kalamazoo River at Plainville, Michigan	1,307
Kalamazoo River at Allegan, Michigan	1,508
Kalamazoo River at mouth, Michigan	2,064
Kalawa River. *See* Calowa River.	
Kansas River at Lecompton, Kansas	58,550
Kansas River at Lawrence, Kansas	59,841
Kansas River in Kansas	34,526
Kansas River in Nebraska	17,455
Kansas River in Colorado	9,459
	61,440
Kaweah River above sec. 3, T. 18 S., R. 27 E., California	619
Kennebec River at outlet of Moosehead Lake, Maine	1,250
Kennebec River below mouth of Dead River, Maine	2,570
Kennebec River at Carritunk Falls, Maine	2,900
Kennebec River at Madison, Maine	3,330
Kennebec River at Norridgewock, Maine	4,030
Kennebec River at Somerset Mills, Maine	4,380
Kennebec River at Waterville, Maine, above mouth of Sebasticook River	4,410

	Square miles.
Kennebec River at Waterville, Maine, below mouth of Sebasticook River	5,470
Kennebec River at Augusta, Maine	5,770
Kennebec River at mouth, Maine	6,330
Kentucky Fork of North Toe River at mouth, North Carolina	4
Kern River at First Point of Measurement, above Bakersfield, California, including North Fork (1,115), South Fork (1,050), and Lower Basin (180)	2,345
Keuka Lake Outlet at foot of Keuka Lake, New York	187
Keuka Lake at outlet, New York	213
King Creek (tributary of French Broad River) on Brevard road, North Carolina	3
King River at Red Mountain, California	1,775
Knights Creek (tributary of Genesee River) at mouth, New York	22
Lake Creek at Twin Lakes, Colorado	109
Lake Creek at Interlaken station (between Twin Lakes), Colorado	104
Lake Erie	34,480
Lake Fork (tributary of Duchesne River) at mouth, Utah	475
Lake George at outlet, New York, including area of water surface (50)	238
Lake Huron	80,400
Lake Michigan	68,100
Lake Ontario	32,980
Lake St. Clair	6,815
Lake Superior	75,300
Laramie River above Woods Landing, Wyoming (in Colorado, 343)	435
Laramie River at Uva, Wyoming, including 428 square miles in Colorado	3,179
Laramie River at mouth, Fort Laramie, Wyoming, not including 500 square miles of lost drainage of James Lake, Cooper Lake, etc	4,076
Laurel Creek (tributary of French Broad River) above mouth, North Carolina	136
Laurel Creek, Upper (tributary to Watauga River), at mouth, North Carolina	7
Laurel Creek, Lower (tributary of Watauga River), at mouth, North Carolina	7
Laurel Fork of Doe River at Allentown, Tennessee	26
Laurel Fork of Holston River 1 mile below Damascus, Virginia	172
Lees Creek (tributary of French Broad River) at Olivette, North Carolina	5
Linville River at Linville Falls, North Carolina	46
Linville River at mouth, North Carolina	87
Little River (tributary of French Broad River) at bridge three-fourths mile above mouth, North Carolina	59
Little River (tributary of New River) at ford on Independence–Oldtown road, Virginia	134
Little Androscoggin River at mouth, Maine	380
Little Bald Mountain Creek at mouth, North Carolina	3
Little Crabtree Creek (tributary of Nolichucky River) above lower ford on Micaville–Sprucepine road, North Carolina	19
Little Delaware Creek (tributary of Delaware River) near mouth, New York	53
Little Doe River (tributary of Watauga River) at Allentown, Tennessee	31
Little Goose Creek at Sheridan, Wyoming	128
Little Patuxent River at mouth, Maryland	139

	Square miles.
Little Pine Creek (tributary of French Broad River) above mouth, North Carolina	15
Littlerock Creek at head of South Antelope Valley Irrigation Company's canal, near Palmdale, California	78
Little Tennessee River at Judson, North Carolina	682
Little Truckee River at Boca, California	171
Little Wood River at Toponis, Idaho	1,270
Locust Creek (tributary of Nolichucky River) at mouth, North Carolina	6
Logan River at Logan, Utah	218
Lookingglass River (tributary of Grand River) at mouth, Michigan	306
Los Angeles River above Devils Gate reservoir site, California	28
Los Angeles River above Narrows at Burbank, California, including Tujunga Canyon (116), Arroyo Seco Canyon (18.1), Millard Canyon (3.1), Eaton Canyon (6.5), Little Santa Anita Canyon (2.5), and Santa Anita Canyon (11.1)	470
Los Pinos River at north line of Southern Ute Indian Reservation, Colorado	321
Los Pinos River at Ignacio Agency, Colorado	450
Los Pinos River at mouth, Colorado	650
Loup River at Columbus, Nebraska	13,542
Lovell Creek (tributary of Black River) at mouth, New York	34
Lower Creek (tributary of Catawba River) near Morganton, North Carolina	87
Lower Black Creek (tributary of Genesee River) at mouth, New York	212
Lower Laurel Creek (tributary of Watauga River) at mouth, North Carolina	7
Madison Brook (tributary of Chenango River) at mouth, New York	9
Madison River at Redbluff, Montana	2,085
Madison River at Threeforks, Montana	2,420
Magolloway River at mouth, Maine	420
Malade River at Toponis, Idaho	2,190
Malade River at Bliss, Idaho	3,550
Malheur River at Vale, Oregon	9,900
Mancos River at Mancos, Colorado	117
Mancos River at mouth, Colorado	855
Manti Creek at Manti, Utah	31
Maple Creek (tributary of Broad River) on bridge near mouth, North Carolina	13
Maple River above Maple Rapids, Michigan	459
Maple River at mouth, Michigan	919
Martin Creek (tributary of Nolichucky River) near Erwin, Tennessee	6
Martins Creek (tributary of Black River) at mouth, New York	29
Mattawamkeag River below outlet of Baskahegan Lake, Maine	190
Mattawamkeag River at mouth, Maine	1,530
Meat Camp Creek (tributary of New River) one-fourth mile below Moretz, North Carolina	19
Medicine River at Kiowa, Kansas	1,300
Merced River at Merced Falls, California	1,076
Merrimac River at Lawrence, Massachusetts	4,553
Messalonskee River at mouth, Maine	205
Middle Branch of any river, *see* the river.	
Middle Creek near Bozeman, Montana	55
Middle Creek (tributary of Nolichucky River) at ford on Micaville–Marion road, North Carolina	2

	Square miles.
Middle Fork of any river, *see* the river.	
Middle Loup River at St. Paul, Nebraska	6,849
Middle Saluda Creek 1 mile above mouth, North Carolina	54
Milk River at Havre, Montana, including Bad Water Lake	7,300
Mill Creek at Crafton, California	47
Mill Creek (tributary of Holston River) 1 mile above mouth, Virginia	7
Mill Creek (tributary of Catawba River) near mouth, North Carolina	16
Mills River (tributary of French Broad River) on Old Haywood road, North Carolina	73
Mississippi River at St. Paul, Minnesota, including Minnesota River (16,350)	36,085
Missoula River at Missoula, Montana	5,960
Missouri River at Townsend, Montana	14,500
Missouri River at Canyon Ferry, Montana	15,036
Missouri River at Craig, Montana	17,615
Missouri River in Montana	81,018
Missouri River in Wyoming	760
	81,778
Mitchell River (tributary of Yadkin River) at railroad trestle, North Carolina	113
Mohave River at Victorville, California	400
Mohawk River at Ridge Mills, New York	153
Mohawk River at Rome, New York	184
Mohawk River at Utica, New York	524
Mohawk River at Little Falls, New York	1,306
Mohawk River below mouth of Schoharie Creek, New York	3,100
Mohawk River at Freeman's bridge, Schenectady, New York	3,212
Mohawk River at State dam, Rexford Flats, New York	3,385
Mohawk River at mouth, New York	3,468
Monocacy River at Frederick, Maryland	665
Monocacy River at mouth, Maryland	941
Monongahela River at Weston, West Virginia	140
Monongahela River at Fairmont, West Virginia	2,324
Monongahela River at Morgantown, West Virginia	2,749
Monongahela River at Greensboro, Pennsylvania	4,574
Monongahela River at Lock No. 4, Pennsylvania	5,427
Moody Mill Creek (tributary of Watauga River) at mouth, North Carolina	3
Moose River at outlet into Moosehead Lake, Maine	1,250
Moose River (tributary of Black River) at cable station, New York	346
Moose River (tributary of Black River) at mouth, New York	406
Mud Creek (tributary of French Broad River) at road crossing near mouth, North Carolina	116
Mud Creek (tributary of Clyde River) at Lyons, New York	298
Muddy Creek (tributary of Catawba River) near mouth, North Carolina	67
Mulberry Creek (tributary of Johns River) at Collettsville, North Carolina	32
Mulberry Creek (tributary of New River) at mouth, North Carolina	35
Mulberry River (tributary of Yadkin River) at railroad trestle, North Carolina	44
Muskegon River above Clam River, Michigan	787
Muskegon River below Clam River, Michigan	1,094
Muskegon River above Big Rapids, Michigan	1,764

	miles.
Muskegon River above Newaygo, Michigan	2,352
Muskegon River above mouth, Michigan	2,663
Muskingum River at Zanesville, Ohio	5,828
Muskrat Lake and group, Michigan (water surface 8 square miles)	57
Nantahala River at mouth, North Carolina	193
Naches River at North Yakima, Washington	1,000
Neatahwanta Lake at outlet, New York	23
Neosho River at Iola, Kansas	3,670
Neshaminy Creek below the forks, Pennsylvania	139
Neuse River at Selma, North Carolina	1,175
Neversink River (tributary of Delaware River) near mouth, New York	346
Newfound Creek (tributary of French Broad River) three-fourths mile above mouth, North Carolina	33
Newfound Creek (tributary of French Broad River) at mouth, North Carolina	34
New River, North Fork, at Weaversford, North Carolina	278
New River, North Fork, 1 mile below Creston, North Carolina	65
New River, South Fork, at New River, North Carolina	327
New River, South Fork, at Riverside, North Carolina	102
New River, East Fork, at ford on Boone–Aho road, North Carolina	6
New River, Middle Fork, at ford on Boone–Aho road, North Carolina	14
New River at Oldtown, Virginia	1,100
New River at Radford, Virginia	2,725
New River above Greenbrier River, West Virginia	4,523
New River at Hinton, West Virginia	5,600
New River at Fayette, West Virginia	6,200
Ninemile Creek 1 mile below Stittville, New York, gaging station	63
Ninemile Creek at mouth, New York	74
Niobrara River at Fort Niobrara, Nebraska	6,300
Nolichucky River above Tennessee State line	640
Nolichucky River at Chucky Valley, Tennessee	817
North (of James) River at East Glasgow, Virginia	831
North Boulder Creek near Boulder, Colorado	102
North Branch of any river, *see* the river.	
North Broad River at Carlton, Georgia	763
North Fork of any river, *see* the river.	
North Indian Creek (tributary of Nolichucky River) at Erwin, Tennessee	61
North Loup River at St. Paul, Nebraska	4,024
North Platte River above Sweetwater River, including 1,696 in Colorado	7,668
North Platte River above Douglas, Wyoming	14,255
North Platte River above Orin Junction, Wyoming	14,828
North Platte River at Guernsey, Wyoming	16,243
North Platte River above Fort Laramie, Wyoming	16,416
North Platte River below Laramie River, Wyoming	20,492
North Platte River in Wyoming and Colorado	23,643
North Platte River at Gering, Nebraska	24,340
North Platte River at Camp Clarke, Nebraska	24,830
North Platte River at North Platte, Nebraska	28,517
North Saluda Creek 2 miles below Humphrey's store, North Carolina	18
North Saluda Creek at ford on Lima Cleveland Mills road, North Carolina	42
North Saluda Creek at iron bridge at Marietta, North Carolina	59
North Toe River (tributary of Nolichucky River) at Sprucepine, North Carolina	128

	Square miles.
North Toe River (tributary of Nolichucky River) at ford on Linnville–Cranberry road, North Carolina	9
North Toe River, Kentucky Fork of, at mouth, North Carolina	4
Nottely River at Ranger, North Carolina	272
Oak Creek (tributary of Susquehanna River) at mouth, New York	115
Oaliout Creek (tributary of Susquehanna River) at mouth, New York	115
Oatka Creek at Warsaw, New York	28
Ocmulgee River at Macon, Georgia	2,425
Oconee River at Carey, Georgia	1,346
Oconee River at Dublin, Georgia	4,182
Octoraro Creek at mouth, Rowlandsville, Maryland	217
Ogden River at Powder Mills, near Ogden, Utah	360
Oldfield Creek (tributary of New River) near mouth, North Carolina	13
Olentangy River at Galion, Ohio	29
Olentangy River at mouth, Columbus, Ohio	532
Oneida Creek (tributary of Oneida River) at Kenwood, New York	59
Oneida Creek (tributary of Oneida River) at mouth, New York	149
Oneida Lake at outlet, New York	1,300
Oneida River at mouth, New York	1,402
Oostanaula River at Resaca, Georgia	1,614
Oostanaula River at mouth, Rome, Georgia	2,152
Oriskany Creek at State dam, Oriskany, New York	144
Oriskany Creek at Coleman, New York	141
Oriskany Creek at mouth, New York	146
Oswego River below Three River Point, New York	167
Oswego River below junction of Seneca and Oneida rivers, New York	4,868
Oswego River at Fulton, New York	4,916
Oswego River at gaging station, New York	4,990
Oswego River at high dam near Oswego, New York	5,000
Oswego River at mouth, New York	5,002
Otego Creek (tributary of Susquehanna River) at mouth, New York	106
Otisco Lake at outlet, New York	41
Otselic River (tributary of Susquehanna River) at mouth, New York	259
Otter Creek (tributary of Black River) at mouth, New York	60
Onondaga Lake at outlet, New York	267
Oquago Creek, New York. *See* Coquago Creek.	
Owasco Outlet at Owasco Inlet, New York	120
Owasco Outlet at foot of Owasco Lake, New York	208
Owasco Outlet at Auburn, New York	212
Owasco Outlet at mouth, New York	230
Owego Creek (tributary of Susquehanna River) at mouth, New York	391
Owyhee River at Owyhee, near Ontario, Oregon	9,875
Paddys Creek (tributary of Catawba River) near mouth, North Carolina	13
Palouse River at Hooper, Washington	2,210
Palouse River below mouth of Cow Creek, Washington	2,460
Passadumkeag River at mouth, Maine	400
Patapsco River, South Branch, Maryland	84
Patapsco River, North Branch, Maryland	166
Patapsco River at Woodstock, Maryland	251
Patapsco River above Patapsco Station, Maryland	361
Patuxent River above mouth of Little Patuxent River, Maryland	194
Patuxent River at Laurel, Maryland	137
Patuxent River below junction of West Branch	515

	Square miles.
Pawpaw Creek (tributary of French Broad River) 1 mile above mouth, North Carolina	4
Pawpaw River (tributary of St. Joseph River) at mouth, Michigan	429
Payette River at Payette, Idaho	3,565
Peach Bottom Creek (tributary of New River) above mouth, Virginia	28
Penobscot River opposite extremity of Moosehead Lake, below mouth of Nulhedus Creek, Maine	600
Penobscot River at entrance to Chesuncook Lake, Maine	870
Penobscot River at outlet of Chesuncook Lake, Maine	1,440
Penobscot River at outlet of Twin Lakes, Maine	1,990
Penobscot River below mouth of East Branch, Maine	3,160
Penobscot River below mouth of Piscataquis River, Maine	6,590
Penobscot River at Oldtown, Maine	7,240
Penobscot River at Bangor, Maine	7,910
Penobscot River at mouth, Maine	8,550
Penobscot River, East Branch, at mouth, Maine	1,170
Pepacton River (tributary of Delaware River) at mouth, New York	919
Perkiomen Creek at Frederick, Pennsylvania	152
Phillips Creek (tributary of Genesee River) at mouth, New York	32
Piedra River at Arboles, Colorado	670
Pigeon Creek (tributary of Nolichucky River) at mouth, North Carolina	5
Pigeon Roost Creek (tributary of Nolichucky River) at mouth, North Carolina	11
Pigeon River at Newport, Tennessee	655
Piscataquis River at Dover, Maine	380
Piscataquis River below outlet of Sebec Lake, Maine	750
Piscataquis River at mouth, Maine	1,500
Platte River at North Platte, Nebraska:	
North Platte River 28,517	
South Platte River 23,294	
	51,811
Platte River at Columbus, Nebraska	56,867
Platte River, North and South, in Colorado 22,230	
Platte River, North and South, in Nebraska 10,850	
Platte River, North and South, in Wyoming 24,240	
	57,320
Platte River, South Fork, at Lake Cheesman, Colorado	1,677
Plum Tree Creek (tributary of Nolichucky River) at mouth, North Carolina	6
Pomer Creek (tributary of Holston River) at mouth, Virginia	13
Portage River (tributary of St. Joseph River) at mouth, Michigan	178
Portneuf River at McCammon, Idaho	500
Portneuf River at Pocatello, Idaho	1,130
Potomac River, North Branch, above Bloomington, Maryland	293
Potomac River, North Branch, at Piedmont, West Virginia, including Savage Creek (111)	409
Potomac River, North Branch, at Cumberland, Maryland, including New Creek at mouth, Keyser, West Virginia (56)	891
Potomac River, North Branch, at junction with South Branch, including Patterson Creek at Burlington, below Mill Creek (155), and at mouth (279)	1,365
Potomac River, South Branch, at junction with North Fork, including 188 square miles at Franklin	318

	Square miles.
Potomac River, South Branch, including North Fork below Seneca Creek (240) and at mouth (322)	640
Potomac River, South Branch, at Moorefield, West Virginia, including Mill Creek at mouth (101)	897
Potomac River, South Branch, below Moorefield, including South Fork at Fort Seybert, West Virginia (155), and at mouth, at Moorefield (301)	1,198
Potomac River, South Branch, at Romney, West Virginia	1,407
Potomac River, South Branch, at U. S. G. S. gaging station at railway bridge between Romney and Springfield, West Virginia	1,443
Potomac River, South Branch, at mouth, West Virginia	1,487
Potomac River at new gaging station, West Virginia	1,440
Potomac River at junction of North and South branches, West Virginia	2,852
Potomac River above Great Cacapon River, including Little Cacapon River, West Virginia (117)	3,388
Potomac River below Great Cacapon River, including Great Cacapon above North River (404) and at mouth, West Virginia (671)	4,059
Potomac River at Hancock, West Virginia	4,099
Potomac River at Williamsport, Maryland, including Warmspring Creek at mouth (16), Conoloway Creek (125), Sleepy Creek (146), Licking Creek (195), Back Creek (288), and Conocockeague Creek (579)	5,556
Potomac River at Harpers Ferry, West Virginia, including Opequan Creek (335) and Antietam Creek (305)	6,354
Potomac River below Harpers Ferry, West Virginia, including Shenandoah River (3,009)	9,363
Potomac River at Weverton, Maryland	9,397
Potomac River at Point of Rocks, Maryland	9,654
Potomac River at Edwards Ferry below Goose Creek, including Monocacy River at mouth (941) and Goose Creek (384)	11,100
Potomac River at Great Falls, Maryland, including Seneca Creek (132)	11,427
Potomac River at Chain Bridge, District of Columbia	11,545
Prairie River (tributary of St. Joseph River) at mouth, Michigan	164
Prather Creek (tributary of New River) at ford one-half mile below Scottville, North Carolina	9
Price Creek (tributary of Nolichucky River) at mouth, North Carolina	18
Prosser Creek at Boca, California	55
Provo River at Provo, Utah	640
Purgatory Creek at Trinidad, Colorado	742
Purgatory Creek at Las Animas, Colorado	3,040
Queen Creek at Whitlow's ranch, Arizona	143
Rack River at mouth, Michigan	213
Reedy Patch Creek (tributary of Broad River) at mouth, North Carolina	12
Reams Creek (tributary of French Broad River) at mouth, North Carolina	36
Red Bank Creek (tributary of Allegheny River) at Brookville, Pennsylvania	400
Red Cedar River at Agricultural College, Michigan	358
Red Cedar River at mouth, Michigan	472
Reddie Creek (tributary of Yadkin River) at North Wilkesboro, North Carolina	95
Red River in Texas	15,800
Red Rock Creek at Redrock, Montana	1,330
Republican River, North Fork, at Haigler, Nebraska	1,390
Republican River at Superior, Nebraska	22,347

	Square miles.	
Republican River at Junction, Kansas		25,837
Republican River in Colorado	7,926	
Republican River in Nebraska	10,415	
Republican River in Kansas	7,496	
		25,837
Rice Creek at Marshall, Michigan, 1 mile above mouth		99
Rio Grande at Del Norte, Colorado		1,400
Rio Grande at Cenicero, Colorado		7,695
Rio Grande at Embudo, New Mexico		10,090
Rio Grande at Rio Grande, New Mexico		14,050
Rio Grande at San Marcial, New Mexico		28,067
Rio Grande at El Paso, Texas		30,000
Rio Grande in Colorado	7,493	
Rio Grande in New Mexico	72,380	
Rio Grande in Texas	80,550	
		160,423
Roan Creek (tributary of Watauga River) at Butler, Tennessee		164
Roanoke River at Roanoke, Virginia		388
Roanoke River at Clarksville, Virginia		7,344
Roanoke River at Neal, North Carolina		8,717
Roaring Creek (tributary of Nolichucky River) at mouth, North Carolina		10
Roaring River (tributary of Yadkin River) at Roaring River, North Carolina		137
Rock Creek (tributary of Nolichucky River) at ford on Micaville–Marion road, North Carolina		2
Rock Creek at Battle Mountain, Nevada		725
Rock Creek at Zoological Park, District of Columbia		83
Rush Creek (tributary of Genesee River) at mouth, New York		35
Rush Creek (tributary of Holston River) at mouth, Virginia		8
Rockhouse Creek (tributary of Watauga River) at mouth, North Carolina		2
Saco River at Fryeburg, Maine		439
Saco River at Great Falls at Hiram, Maine		856
Saco River at Highland Rips, Maine		1,366
Saco River at Bonny Eagle Falls, Maine		1,578
Sacramento River at Jellys Ferry, California		9,134
Sacramento River above Redbluff, California		9,356
Sacramento and San Joaquin rivers in California	63,020	
Sacramento River in Oregon	655	
		63,675
Sacandaga River, South Branch, at mouth, New York		240
Sacandaga River, East Branch, at mouth, New York		124
Sacandaga River, Middle Branch, at mouth, New York		115
Sacandaga River below Stony Creek, New York		223
Sacandaga River at mouth, New York		1,056
St. Clair Creek (tributary of Holston River) at mouth, Virginia		8
St. Croix River, West Branch, at Princeton dam, Maine		540
St. Croix River, West Branch, at confluence with main river, Maine		750
St. Croix River at Grand (Schoodic) Lake, Maine		420
St. Croix River at Little Falls, Maine		500
St. Croix River above mouth of West Branch, Maine		650
St. Croix River below mouth of West Branch, Maine		1,400
St. Croix River at Sprague Falls, Maine		1,450
St. Croix River at lower dam at Calais, Maine		1,530
St. Croix River at mouth, eastern border of Calais, Maine		1,630

	Square miles.
St. Joseph River above Three Rivers, Michigan	863
St. Joseph River below Three Rivers, Michigan	1,417
St. Joseph River above Niles, Michigan	3,616
St. Joseph River below mouth of Dowagiac River, Michigan	3,898
St. Joseph River above mouth of Pawpaw River, Michigan	4,157
St. Joseph River below mouth of Pawpaw River, Michigan	4,586
St. Louis River above Cloquet, Minnesota	3,272
St. Vrain Creek near Lyons, Colorado	209
Salina Creek at Salina, Utah	255
Salinas River at Salinas, California	4,940
Saline River at Beverly, Kansas	2,730
Saline River at mouth, Kansas	3,311
Salmon Creek (tributary of Cayuga Lake) at mouth, New York	90
Salmon River 1 mile above falls, New York	191
Salmon River at bridge station, New York	264
Salt Lake, Utah. *See* Great Salt Lake.	
Salt River below Tonto Creek, Arizona	5,756
Salt River in canyon 20 miles above Verde River, Arizona	5,880
Salt River at Arizona dam, Arizona	12,260
Salt River at McDowell, Arizona, above Verde River	6,260
Saluda River at Waterloo, South Carolina	1,056
Sandy Mush Creek (tributary of French Broad River) at mouth, North Carolina	81
San Emidio Creek, California	54
San Gabriel River at canyon above Azusa, California	220
San Gabriel River above narrows at Paso de Bartolo Rancho, California	567
San Joaquin River at Herndon, California	1,637
San Juan River at Arboles, Colorado	1,320
San Miguel River at Fallscreek, Colorado	327
San Pedro River at Dudleyville, Arizona	2,870
San Pedro River in Arizona	3,336
San Pedro River in Mexico	120
	3,456
San Pitch River at Gunnison, Utah	836
Sandy River at Farmington, Maine	340
Sandy River at mouth, Maine	650
Santa Ana River at Warmsprings, California	188
Saquoit Creek at New York Mills, New York	52
Saquoit Creek at mouth, New York	67
Savannah River at Calhoun Falls, Georgia	2,712
Savannah River at Augusta, Georgia	7,294
Schoharie Creek at Gilboa, New York	308
Schoharie Creek at Central Bridge, New York	684
Schoharie Creek at State dam at Fort Hunter, New York	947
Schoharie Creek at Schoharie Falls, New York	930
Schoharie Creek at Mill Point, New York	934
Schroon River at foot of Schroon Lake, New York	479
Schroon River at Tumblehead Falls, New York	502
Schroon River at Warrensburg, New York, gaging station	563
Schroon River at mouth, New York	550
Scioto River at Kenton, Ohio	153
Scioto River at Columbus, Ohio	1,070
Scioto River at Shadeville, Ohio, including Olentangy River (523)	1,670
Scioto River at mouth, Ohio	6,432

	Square miles.
Sebago Lake near outlet, Maine	470
Sebasticook River at mouth, Maine	1,060
Seneca Lake at outlet, New York	707
Seneca River at foot of Seneca Lake, New York	707
Seneca River at Waterloo, New York	745
Seneca River at Seneca Falls, New York	771
Seneca River at entrance to Cayuga Lake, New York	780
Seneca River below Cayuga Lake, New York	1,593
Seneca River at Montezuma, New York	2,472
Seneca River at Baldwinsville, New York	3,103
Seneca River at junction with Oneida River, New York	3,433
Sevier River at Gunnison, Utah	3,986
Sevier River at Leamington, Utah	5,595
Shenandoah River, North Fork, at Brocks Gap, Virginia	215
Shenandoah River, North Fork, at Mount Jackson, Virginia	511
Shenandoah River, North Fork, at Riverton, Virginia	1,037
Shenandoah River, South Fork, at Port Republic, Virginia, including Middle River at junction with North River (363), North River at junction with Middle River (418), North River at junction with South River (804), South River at junction with North River (246)	1,050
Shenandoah River, South Branch, at Shenandoah, Virginia	1,288
Shenandoah River, South Branch, at Overall, Virginia	1,491
Shenandoah River, South Branch, at mouth at Riverton, Virginia	1,587
Shenandoah River, South Branch, at Front Royal, Virginia, gaging station	1,569
Shenandoah River at Riverton, Virginia, including North Fork (1,037) and South Fork (1,587)	2,624
Shenandoah River at Millville, West Virginia	2,995
Shenandoah River at mouth, Harpers Ferry, West Virginia	3,009
Shoshone River, South Fork, at Marquette, Wyoming	500
Shoshone River at Corbett, Wyoming	1,718
Shoshone River at Lovell, Wyoming	2,720
Shut-in Creek (tributary of French Broad River) at ford on Hot Springs–Point Rock road, North Carolina	9
Silver Creek (tributary of Catawba River) near mouth, North Carolina	62
Silver Lake (tributary of Genesee River) at mouth, New York	30
Sinking Creek, or Beidlemans Creek (tributary of Holston River) at mouth, Tennessee	25
Sinking Creek (tributary of Watauga River) at lower ford, Tennessee	12
Skaneateles Lake at outlet, New York	73
Smoky Hill River at Ellsworth, Kansas, including drainage in Colorado (1,533) and Kansas (6,447)	7,980
Smoky Hill River below Ellsworth, Kansas, exclusive of Saline and Solomon rivers	2,255
Smoky Hill River at mouth, Junction, Kansas	20,428
Snake River, North Fork, at Ferry, Idaho	931
Snake River at Idaho Falls, Idaho	10,100
Snake River at Montgomery Ferry, Idaho	22,600
Snake River in Idaho	73,500
Snake River in Nevada	5,280
Snake River in Oregon	17,950
Snake River in Washington	6,682
Snake River in Wyoming	5,268
	108,680

	Square miles.
Soleduck River at Quillayute, Washington	272
Solomon River at Beloit, Kansas	5,539
Solomon River at Niles, Kansas	6,815
Solomon River at mouth, Kansas	6,882
South River at Port Republic, Virginia	1,050
South (of James) River at mouth, Virginia	116
South Boulder Creek at South Boulder Canyon, near Marshall, Colorado	125
South Branch or Fork of any river, *see* the river.	
South Indian Creek (tributary of Nolichucky River) at mouth, near Erwin, Tennessee	85
South Platte River at Lake Cheesman, Colorado, gaging station	1,677
South Platte River at Deansbury, Colorado	2,600
South Platte River at Platte Canyon, Colorado	2,620
South Platte River at Denver, Colorado, including Bear Creek at Morrison (170)	3,840
South Platte River at Greeley, Colorado, above mouth of Cache la Poudre River	7,110
South Platte River below Greeley, Colorado	9,575
South Platte River at Orchard, Colorado	12,260
South Platte River at mouth, North Platte, Nebraska	23,294
South Toe River (tributary of Nolichucky River) at ford on Micaville-Sprucepine road, North Carolina	59
South Toe River (tributary of Nolichucky River) 1 mile above mouth of Three Fork Creek, North Carolina	19
Spanish Fork in canyon near Spanish Fork, Utah	670
Spokane River at Spokane, Washington	4,005
Spring Creek (tributary of French Broad River) at Hot Springs, North Carolina	73
Spring Creek (tributary of Holston River) at mouth, Virginia	16
Squirrel Creek (tributary of Nolichucky River) at mouth, North Carolina	5
Staley Creek (tributary of Holston River) at Marion, Virginia	12
Stanislaus River at Oakdale, California	1,051
Staunton River at Clarksville, Virginia	3,546
Steamboat Creek at Steamboat Springs, Nevada	40
Stony Creek (tributary of Sacandaga River) at mouth, New York	212
Stony Creek (tributary of Watauga River) one-half mile above mouth, Tennessee	49
Strawberry Creek (tributary of Duchesne River) at mouth, Utah	1,166
Sugar River (tributary of Black River) at mouth, New York	66
Sun River at Augusta, Montana	1,175
Susquehanna River, West Branch, at Allenwood, Pennsylvania	6,538
Susquehanna River, West Branch, at mouth, Pennsylvania	7,027
Susquehanna River above mouth of Oak Creek, New York	97
Susquehanna River below mouth of Oak Creek, New York	212
Susquehanna River below mouth of Unadilla River, New York	1,638
Susquehanna River at Nineveh, New York	1,789
Susquehanna River at Susquehanna, New York	2,024
Susquehanna River at Birmingham, New York	2,279
Susquehanna River above mouth of Chemung River, New York	4,945
Susquehanna River at Pennsylvania-New York State line	6,267
Susquehanna River below mouth of Chemung River, Pennsylvania	7,463
Susquehanna River at Wilkesbarre, Pennsylvania	9,810
Susquehanna River at Danville, Pennsylvania	11,070
Susquehanna River above confluence with West Branch, Pennsylvania	11,142

	Square miles.
Susquehanna River at Harrisburg, Pennsylvania	24,030
Susquehanna River at mouth, Pennsylvania	27,405
Swannanoa River, North Fork, at bridge 3 miles above Swannanoa post-office, North Carolina	30
Swannanoa River (tributary of French Broad River) at Biltmore, North Carolina	124
Sweetwater River at mouth, Wyoming	2,929
Sweetwater River at Sweetwater dam, California	186
Tahoe Lake at outlet, California (water surface 193 square miles)	502
Talladega Creek at Nottingham, Alabama	156
Tallapoosa River at Sturdevant, Alabama	2,500
Tallapoosa River at Susanna, Alabama	2,610
Tallapoosa River at Milstead, Alabama	3,840
Tallulah River at Tallulah Falls, Georgia	191
Tar River at Tarboro, North Carolina	2,290
Tanghanic Creek (tributary of Cayuga Lake) at mouth, New York	60
Tehachapi Creek (tributary of Caliente Creek), California	108
Tejon House Creek at Tejon ranch, California	17
Tennessee Fork of Arkansas River near Leadville, Colorado	44
Tennessee River at Chattanooga, Tennessee	21,418
Tennessee River at confluence of Broad and Holston rivers, at Knoxville, Tennessee	8,924
Tennessee River at Knoxville, Tennessee	8,990
Teton River at Wilford, Idaho	967
Thomas Creek (tributary of Holston River) at mouth, Tennessee	11
Thornapple River (tributary of Grand River) at mouth, Michigan	824
Threetop Creek (tributary of New River) on footbridge at Creston, North Carolina	24
Thunder Bay River, North Branch, above mouth, Michigan	199
Thunder Bay River, South Branch, above mouth, Michigan	454
Thunder Bay River above mouth of North Branch, Michigan	580
Thunder Bay River above mouth of South Branch, Michigan	789
Thunder Bay River at Alpena, Michigan	1,267
Tioga River above mouth of Canisteo River, New York	750
Tioga River (tributary of Susquehanna River) at mouth, New York	1,530
Tioughnioga River, West Branch, at mouth, New York	103
Tioughnioga River, East Branch, at mouth, New York	164
Tioughnioga River (tributary of Susquehanna River) above mouth of Atselic River, New York	428
Tioughnioga River (tributary of Susquehanna River) at mouth, New York	735
Tongue River at Miles City, Montana	3,875
Town Creek (tributary of Watauga River) at Shoun crossroads, Tennessee	19
Three Fork Creek (tributary of Nolichucky River) ¼ mile above mouth, North Carolina	5
Thompson Creek near Loveland, Colorado	305
Toccoa River at Blueridge, Georgia	231
Toe River (tributary of Nolichucky River) at Huntdale, North Carolina	438
Tohickon Creek at Point Pleasant, Pennsylvania	1,022
Towaliga River at mouth, Juliette, Georgia	350
Truckee River, Upper, at inlet to Lake Tahoe, California	59
Truckee River at Tahoe, California	502
Truckee River at California-Nevada State line	955
Truckee River at mouth of Little Truckee River at Boca, California	869

	Square miles.
Truckee River near Essex, Nevada	991
Truckee River near Laughtons, Nevada	1,014
Truckee River at Vista, Nevada	1,435
Tuckasegee River 3 miles above Bryson, North Carolina	609
Tuckasegee River at Bryson, North Carolina	662
Tucker Creek (tributary of French Broad River) 200 yards above mouth, North Carolina	6
Tugaloo River at Madison, South Carolina	593
Tule River above Portersville, California	437
Turkey Creek (tributary of French Broad River) at Blackwell Springs, North Carolina	28
Turkey Cove Creek (tributary of Catawba River) ¼ mile above mouth, North Carolina	31
Tuscarora Creek (tributary of Susquehanna River) at mouth, New York	120
Tuolumne River at Lagrange, California	1,501
Tuolumne River at Modesto, California	1,635
Uinta River at the canyon, Utah	218
Uinta River at Fort Duchesne, Utah	672
Uinta River at Ouray School, Utah	967
Umatilla River at Gibbon, Oregon	353
Umatilla River at Pendleton, Oregon	640
Umbagog Outlet immediately above junction with Magalloway River, Maine	760
Unadilla River (tributary of Susquehanna River) at mouth, New York	561
Uncompahgre River at Fort Crawford, Colorado	497
Uncompahgre River at Montrose, Colorado	565
Upper Creek (tributary of Catawba River) near mouth, North Carolina	85
Upper Black Creek (tributary of Genesee River) at mouth, New York	39
Upper Laurel Creek (tributary of Watauga River) at mouth, North Carolina	7
Upper Truckee River at inlet to Lake Tahoe, California	59
Valley River at Philippi, West Virginia	620
Van Campens Creek (tributary of Genesee River) at mouth, New York	56
Vandemarck Creek (tributary of Genesee River) at mouth, New York	22
Verde River near Fort McDowell, Arizona	6,000
Verde River 1 mile above Salt River, Arizona	6,000
Verdigris River at McTaggart's mills, Kansas	3,067
Walker Creek (tributary of Holston River) at mouth, Virginia	13
Wallawalla River at Whitman, Washington	310
Wallkill River at New Jersey–New York State line	210
Walnut Creek (tributary of French Broad River) at mouth, North Carolina	17
Watauga River at Elizabethton, Tennessee	408
Watauga River at Butler, Tennessee	261
Watauga River at Watauga Falls, North Carolina	96
Watauga River 1 mile above Shull's mill, North Carolina	12
Watauga River, Boone Fork, at Shull's mill, North Carolina	9
Weber River at Uinta, Utah	1,600
Weiser River at Weiser, Idaho	1,670
Wenache River 7 miles above Wenache, Washington	1,527
West Branch of any river, *see* the river.	
West Canada Creek at Twin Rock Bridge, New York	252
West Canada Creek at Trenton Falls, New York	375
West Canada Creek at Middleville, New York, gaging station	518

	Square miles.
West Canada Creek at Herkimer, New York	548
West Canada Creek at mouth, New York	569
West Fork of any river, *see* the river.	
West Gallatin River at Williams's ranch, Montana	860
White Creek (tributary of Genesee River) at mouth, New York	16
Whiteoak Creek (tributary of South Fork of Toe River) at mouth, North Carolina	3
Whiteoak Creek (tributary of North Fork of Toe River) at mouth, North Carolina	4
Whiterocks River (tributary of Duchesne River) at canyon, Utah	114
White River at city of Whiteriver, Colorado	1,773
White River at Crawford, Nebraska	270
White River at Buckley, Washington	450
Whitetop Creek (tributary of Holston River) at mouth, Virginia	66
Wilsons Creek (tributary of Catawba River) at mouth, North Carolina	70
Wilsons Creek (tributary of New River) 2 miles above mouth, Virginia	37
Wiscoy Creek (tributary of Genesee River) at mouth, New York	109
Wissahickon Creek near Philadelphia, Pennsylvania	65
Wolf Creek (tributary of Holston River) at mouth, Virginia	28
Wolf Creek (tributary of Genesee River) at mouth, New York	19
Wood River at Hailey, Idaho	906
Wood River at Toponis, Idaho	2,190
Yadkin River at second ford below Patterson's mill, North Carolina	86
Yadkin River at Wilkesboro, North Carolina	272
Yadkin River at Siloam, North Carolina	1,219
Yadkin River at Salisbury, or Holtsburg, North Carolina	3,399
Yadkin River at Norwood, North Carolina	4,614
Yakima River at Union Gap, Washington	3,300
Yakima River at Selah, Washington	1,960
Yakima River at Kiona, Washington	5,230
Yellow River at Almon, Georgia	379
Yellowstone River at Horr, Montana	2,635
Yellowstone River at Livingston, Montana	3,580
Yellowstone River in Montana 36,312	
Yellowstone River in North Dakota 250	
Yellowstone River in Wyoming 33,121	
	69,683
Youghiogheny River at Friendsville, Maryland	295
Youghiogheny River at Confluence, Pennsylvania	782
Youghiogheny River at West Newton, Pennsylvania	1,552
Yuba River, Middle Fork, at Freeman's bridge, North San Juan, California	205
Yuba River, North Fork, at Yuba Power Company's dam, North San Juan, California	483
Yuba River at Parks Bar bridge, Smartville, California	1,211
Yukon River in Canada 150,768	
Yukon River in United States 180,144	
	330,912

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[The Water-Supply and Irrigation Papers are limited by law to 100 pages each. It was therefore necessary to divide the report on the operations at river stations for 1900 into six parts. Paper No. 47 contains pages 1 to 100; Paper No. 48, pages 101 to 196; Paper No. 49, pages 197 to 292; Paper No. 50, pages 293 to 388; Paper No. 51, pages 389 to 488; Paper No. 52, pages 489 to 575.]

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1895.

Sixteenth Annual Report of the United States Geological Survey, 1894–95, Part II, Papers of an economic character, 1895; octavo, 598 pp.

Contains a paper on the public lands and their water supply, by F. H. Newell, illustrated by a large map showing the relative extent and location of the vacant public lands; also a report on the water resources of a portion of the Great Plains, by Robert Hay.

A geological reconnoissance of northwestern Wyoming, by George H. Eldridge, 1894; octavo, 72 pp. Bulletin No. 119 of the United States Geological Survey; price, 10 cents.

Contains a description of the geologic structure of portions of the Big Horn Range and Big Horn Basin, especially with reference to the coal fields, and remarks upon the water supply and agricultural possibilities.

Report of progress of the division of hydrography for the calendar years 1893 and 1894, by F. H. Newell, 1895; octavo, 176 pp. Bulletin No. 131 of the United States Geological Survey; price, 15 cents.

Contains results of stream measurements at various points, mainly within the arid region, and records of wells in western Nebraska, western Kansas, and eastern Colorado.

1896.

Seventeenth Annual Report of the United States Geological Survey, 1895–96, Part II, Economic geology and hydrography, 1896; octavo, 864 pp.

Contains papers on "The underground water of the Arkansas Valley in eastern Colorado," by G. K. Gilbert; "The water resources of Illinois," by Frank Leverett; and "Preliminary report on the artesian waters of a portion of the Dakotas," by N. H. Darton.

Artesian-well prospects in the Atlantic Coastal Plain region, by N. H. Darton, 1896; octavo, 230 pp., 19 plates. Bulletin No. 138 of the United States Geological Survey; price, 20 cents.

Gives a description of the geologic conditions of the coastal region from Long Island, New York, to Georgia, and contains data relating to many of the deep wells.

Report of progress of the division of hydrography for the calendar year 1895, by F. H. Newell, hydrographer in charge, 1896; octavo, 356 pp. Bulletin No. 140 of the United States Geological Survey; price, 25 cents.

Contains a description of the instruments and methods employed in measuring streams and the results of hydrographic investigations in various parts of the United States.

1897.

Eighteenth Annual Report of the United States Geological Survey, 1896–97, Part IV, Hydrography, 1897; octavo, 756 pp.

Contains a "Report of progress of stream measurements for the calendar year 1896," by Arthur P. Davis; "The water resources of Indiana and Ohio," by Frank Leverett; "New developments in well boring and irrigation in South Dakota," by N. H. Darton; and "Reservoirs for irrigation," by J. D. Schuyler.

1899.

Nineteenth Annual Report of the United States Geological Survey, 1897–98, Part IV, Hydrography, 1899; octavo, 814 pp.

Contains a "Report of progress of stream measurements for the calendar year 1898," by F. H. Newell and others; "The rock waters of Ohio," by Edward Orton; and "A preliminary report on the geology and water resources of Nebraska west of the one hundred and third meridian," by N. H. Darton.

Part II of the Nineteenth Annual contains a paper on "Principles and conditions of the movements of ground water," by F. H. King, and one on "Theoretical investigation of the motion of ground waters," by C. S. Slichter.

1900.

Twentieth Annual Report of the United States Geological Survey, 1898–99, Part IV, Hydrography, 1900; octavo, 660 pp.

Contains a "Report of progress of stream measurements for the calendar year 1898," by F. H. Newell, and "Hydrography of Nicaragua," by A. P. Davis.

1901.

Twenty-first Annual Report of the United States Geological Survey, 1899–1900, Part IV, Hydrography, 1901; octavo, 768 pp.

Contains a "Report of progress of stream measurements for the calendar year 1899," by F. H. Newell; "Preliminary description of the geology and water resources of the southern half of the Black Hills and adjoining regions in South Dakota and Wyoming," by N. H. Darton; and "The High Plains and their utilization," by W. D. Johnson.

Bulletins can be obtained only by prepayment of cost, as noted above. Money should be transmitted by postal money order or express order, payable to the Director of the United States Geological Survey. Postage stamps, checks, and drafts can not be accepted. Correspondence should be addressed to

The Director, United States Geological Survey, Washington, D. C.

WATER-SUPPLY AND IRRIGATION PAPERS.

1. Pumping water for irrigation, by Herbert M. Wilson, 1896.
2. Irrigation near Phoenix, Arizona, by Arthur P. Davis, 1897.
3. Sewage irrigation, by George W. Rafter, 1897.
4. A reconnoissance in southeastern Washington, by Israel C. Russell, 1897.
5. Irrigation practice on the Great Plains, by E. B. Cowgill, 1897.
6. Underground waters of southwestern Kansas, by Erasmus Haworth, 1897.
7. Seepage waters of northern Utah, by Samuel Fortier, 1897.
8. Windmills for irrigation, by E. C. Murphy, 1897.
9. Irrigation near Greeley, Colorado, by David Boyd, 1897.
10. Irrigation in Mesilla Valley, New Mexico, by F. C. Barker, 1898.
11. River heights for 1896, by Arthur P. Davis, 1897.
12. Underground waters of southeastern Nebraska, by N. H. Darton, 1898.
13. Irrigation systems in Texas, by W. F. Hutson, 1898.
14. New tests of pumps and water lifts used in irrigation, by O. P. Hood, 1898.
15, 16. Operations at river stations, 1897, Parts I, II, 1898.
17. Irrigation near Bakersfield, California, by C. E. Grunsky, 1898.
18. Irrigation near Fresno, California, by C. E. Grunsky, 1898.
19. Irrigation near Merced, California, by C. E. Grunsky, 1899.
20. Experiments with windmills, by Thomas O. Perry, 1899.
21. Wells of northern Indiana, by Frank Leverett, 1899.
22. Sewage irrigation, Part II, by George W. Rafter, 1899.
23. Water-right problems of Big Horn Mountains, by Elwood Mead, 1899.
24, 25. Water resources of the State of New York, Parts I, II, by G. W. Rafter, 1899.
26. Wells of southern Indiana (continuation of No. 21), by Frank Leverett, 1899.
27, 28. Operations at river stations, 1898, Part I, II, 1899.
29. Wells and windmills in Nebraska, by Erwin Hinckley Barbour, 1899.
30. Water resources of the Lower Peninsula of Michigan, by Alfred C. Lane, 1899.
31. Lower Michigan mineral waters, by Alfred C. Lane, 1899.
32. Water resources of Porto Rico, by H. M. Wilson, 1900.
33. Storage of water on Gila River, Arizona, by J. B. Lippincott, 1900.
34. Geology and water resources of southeastern S. Dak., by J. E. Todd, 1900.
35–39. Operations at river stations, 1899, Parts I–V, 1900.
40. The Austin dam, by Thomas U. Taylor, 1900.
41, 42. The windmill: its efficiency and use, Parts I, II, by E. C. Murphy, 1901.
43. Conveyance of water in irrigation canals, etc., by Samuel Fortier, 1901.
44. Profiles of rivers, by Henry Gannett, 1901.
45. Water storage on Cache Creek, California, by Albert E. Chandler, 1901.
46. Reconn. of Kern and Yuba rivers, Cal., by F. H. Olmsted and M. Manson.
47–52. Operations at river stations, 1900, Part I–VI, 1901.

Other papers are in various stages of preparation. Provision has been made for printing these by the following clause in the sundry civil act making appropriations for the year 1896–97:

Provided, That hereafter the reports of the Geological Survey in relation to the gaging of streams and to the methods of utilizing the water resources may be printed in octavo form, not to exceed 100 pages in length and 5,000 copies in number; 1,000 copies of which shall be for the official use of the Geological Survey, 1,500 copies shall be delivered to the Senate, and 2,500 copies shall be delivered to the House of Representatives, for distribution. [Stat. L., vol. 29, p. 453.]

The endeavor is made to send these pamphlets to persons who have rendered assistance in their preparation through replies to schedules or who have furnished data. Requests made for a certain paper and stating a reason for asking for it are granted whenever practicable, but it is impossible to comply with general demands, such as to have all of the series sent.

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